Welcome to Clean Energy Virginia Webinar Series

Utility Scale Solar and Onshore Wind

We will begin in a few minutes

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Housekeeping Rules

- Please mute your mic
- Please use the Q&A box to ask your questions
- We will hold a moderated Q&A session at the end of the presentation
- Any unanswered questions will be answered by the team during the coming week.

Virginia Department of Mines Minerals and Energy

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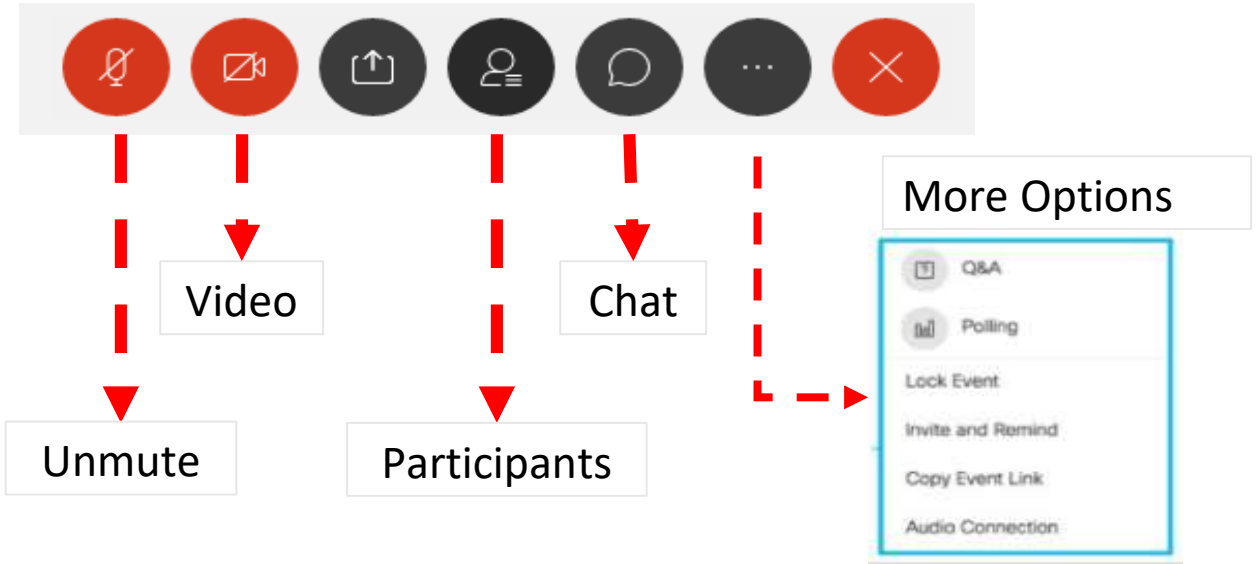
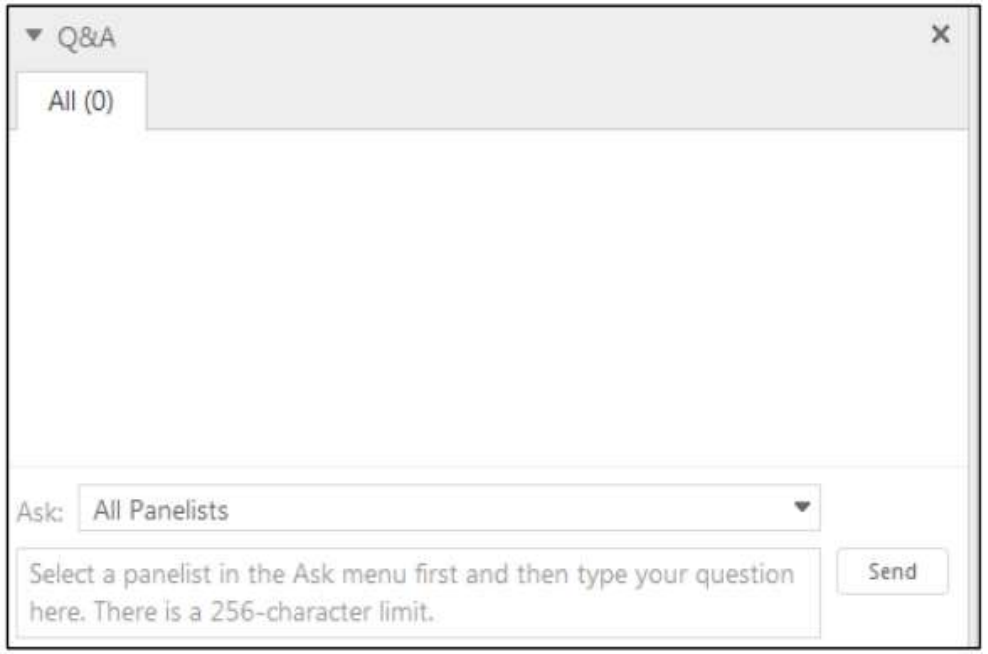
Submit Questions in Q&A on Right Panel

- **Navigation radials at the bottom of your WebEx Screen**





Clean Energy Virginia Webinar Series

Angela Navarro
Deputy Secretary of Commerce and Trade
Office of Governor Northam

Webinar Topics

Webinars will discuss the Commonwealth's clean energy policies and next steps, with a focus on the following subjects:

- Webinar 1: July 22, 2020 Energy Efficiency
- Webinar 2: July 29, 2020 Distributed Generation Solar
- Webinar 3: August 5, 2020 Energy Storage
- Webinar 4: August 12, 2020 Utility Scale Solar and Onshore Wind
- Webinar 5: August 19, 2020 Offshore Wind

Register Today: https://www.dmme.virginia.gov

Presentation Outline

I. VCEA Goals and Regulatory Changes
II. State and National Renewable Energy Outlook
III. Wind and Solar Energy Opportunities in Virginia
IV. Solar Land Use Policy in Virginia
V. Permitting Process and PBR Regulatory Update
VI. Pollinator Smart Solar
VII. Solar Resources and Programs
VIII. Q&A

Guest Speakers

- ✓ Harrison Godfrey, *Virginia Advanced Energy Economy (VA-AEE)*
- ✓ Katharine Kollins, *Southeastern Wind Coalition*
- ✓ Maggie Clark, *Solar Energy Industries Association (SEIA)*
- ✓ Rachel Smucker, *MD-DC-VA Solar Energy Industries Association (MDV-SEIA)*
- ✓ Mary Major, *Dept. of Environmental Quality (DEQ)*
- ✓ Rene' Hypes, *Dept. of Conservation and Recreation (DCR)*
- ✓ Rob Davis, *Fresh-Energy*
- ✓ Elizabeth Marshall, *University of Virginia (UVA)*
- ✓ Carrie Hearne, *Dept. of Mines, Minerals and Energy (DMME)*

Clean Energy Virginia Policy Objectives

- Transition Virginia's electric grid to 100% carbon-free resources by 2050
- Significant build-out of clean energy assets that will drive new investment across the Commonwealth
- Provide the landscape for clean energy businesses to expand or locate in the Commonwealth
- Ensure energy equity and environmental justice while providing benefits to historically economically disadvantaged communities

State Energy Goals: Executive Order 43

30% by 2030

Produce 30 percent of Virginia's electricity from renewable energy sources by 2030

100% by 2050

Produce 100 percent of Virginia's electricity from carbon-free sources by 2050

Energy Equity

Achieve energy goals in a just manner that advance social, energy, and environmental equity

Virginia Clean Economy Act

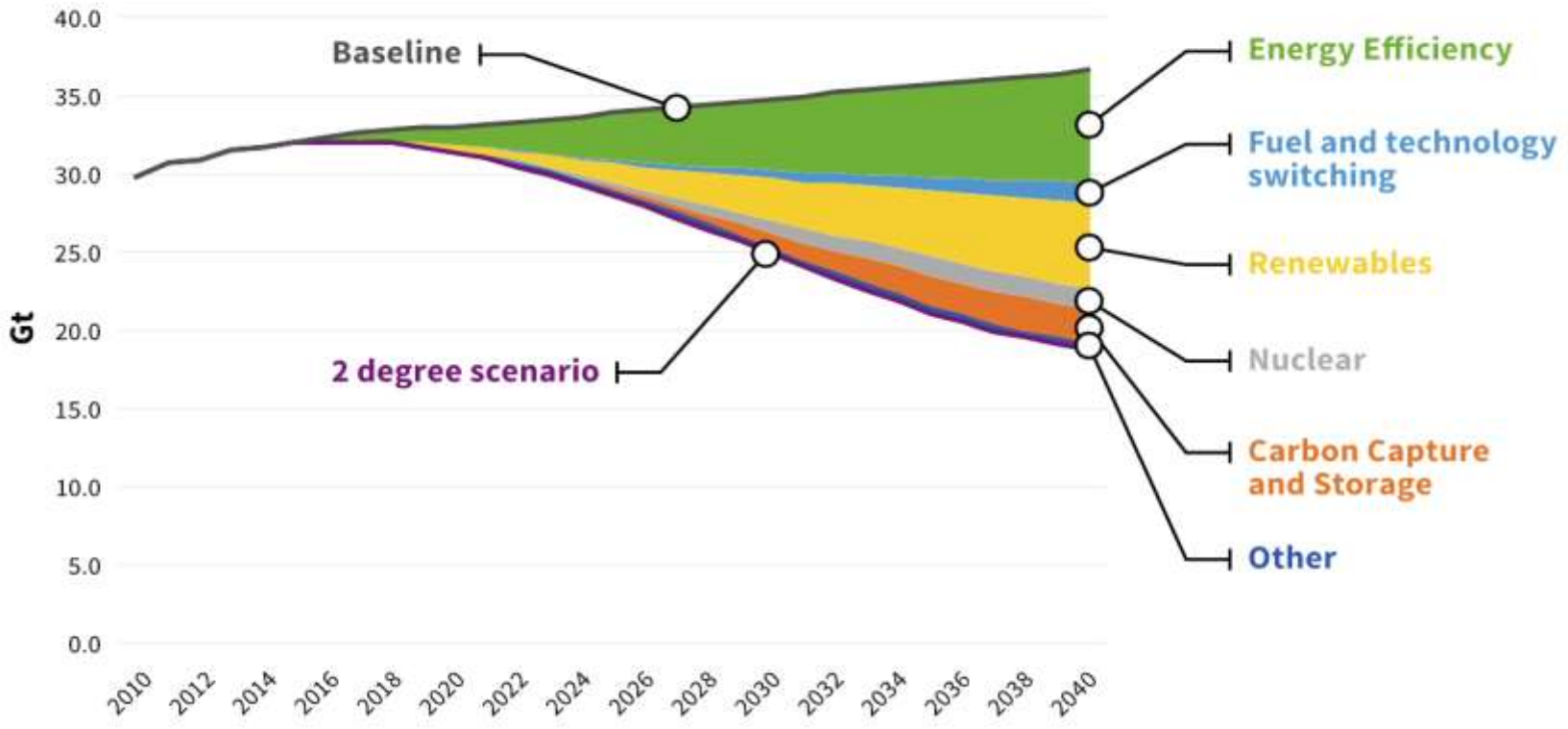
- **Establishes a mandatory renewable portfolio standard (RPS):**
  - Dominion Energy: 40% by 2030; 100% by 2045
  - Appalachian Power: 30% by 2030; 100% by 2050
- **Establishes a mandatory energy efficiency resource standard (EERS):**
  - Dominion Energy: 5% by 2025
  - Appalachian Power: 2% by 2025
- **Deems 16,100 MW of solar and onshore wind, 5,200 MW of offshore wind, and 2,700 MW of energy storage in the public interest.**

VCEA – Major Regulatory Changes

- Requires State Corporation Commission (SCC) to consider the ***social cost of carbon*** in any application to construct new generating facility
- The SCC must ensure development of new energy resources or facilities does not have disproportionate adverse impact on **historically economically disadvantaged communities** (**HEDCs**)
- Establishes a **Percentage of Income Payment Program** (**PIPP**) for low-income households to provide an alternative payment structure

Renewable Energy is Key to Carbon-Free

Figure 4. IEA *Global Energy Outlook* emissions scenario with temperature increase limited to 2 degrees



Source: ACEEE graph using data from International Energy Agency (IEA). www.aceee.org/sites/default/files/publications/researchreports/u1604.pdf

Worker Health & Safety During COVID-19 Pandemic

- Virginia Department of Labor and Industry's Safety and Health Codes Board adopted the first statewide emergency workplace safety standards in the U.S. in response to COVID-19
- These standards mandate appropriate personal protective equipment, sanitation, social distancing, infectious disease preparedness and response plans, record keeping, training, and hazard communications in workplaces across the Commonwealth
- Opportunities to innovate new processes and technologies to protect health and safety

Presentation Partners

VIRGINIA ADVANCED ENERGY ECONOMY

SOUTHEASTERN WIND COALITION

SEIA Solar Energy Industries Association®

MDV-SEIA
MARYLAND | DC | DELAWARE | VIRGINIA
SOLAR ENERGY INDUSTRIES ASSOCIATION

UNIVERSITY of VIRGINIA

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Fresh Energy

DCR
Virginia Department of Conservation & Recreation

DMME
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Audience Poll Question

What type of organization do you represent?

(Please respond using poll in side panel)

Renewable Energy Policy Landscape

Harrison Godfrey
Executive Director

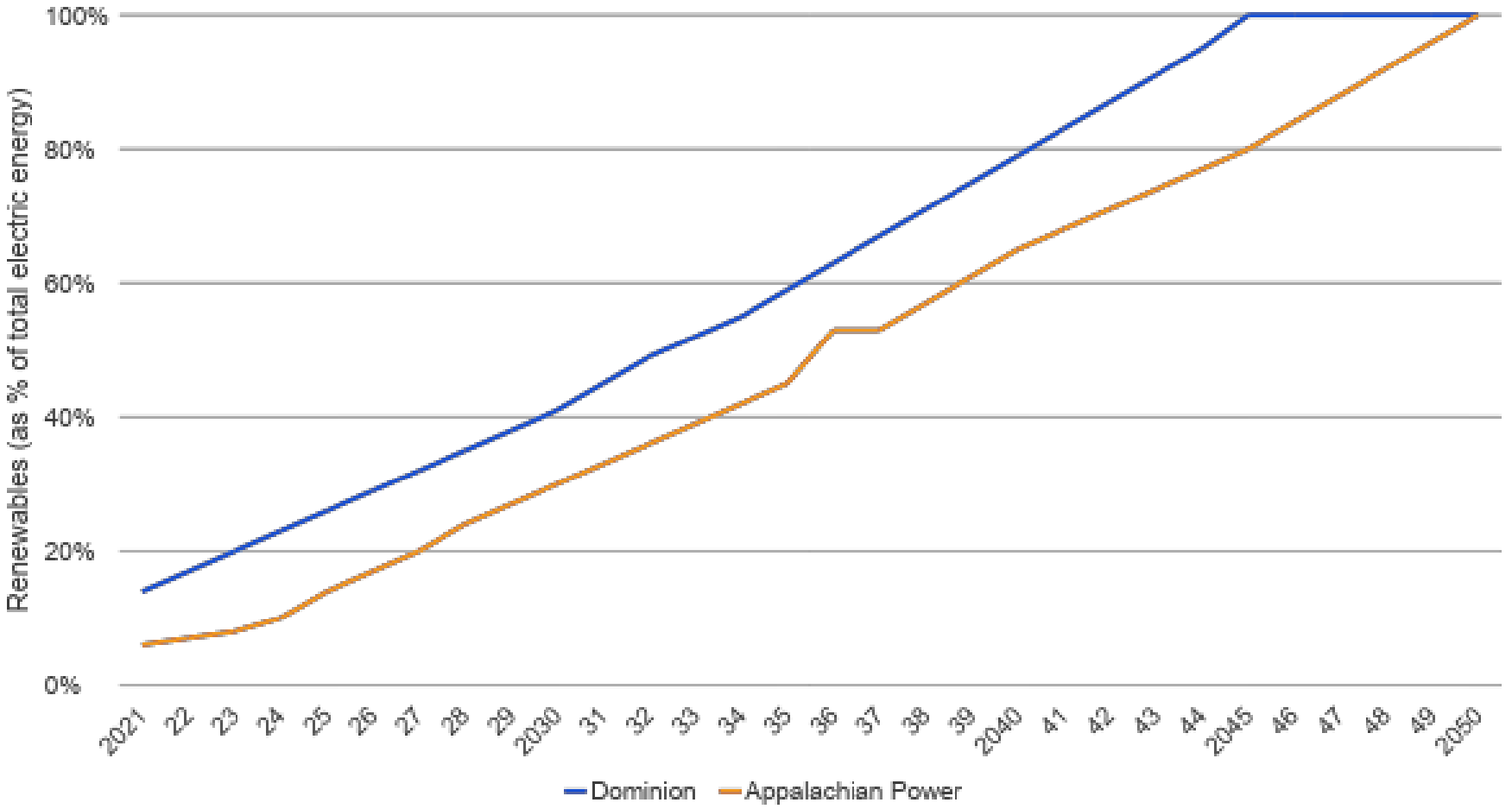
VIRGINIA
ADVANCED ENERGY ECONOMY

Terminology and Acronyms

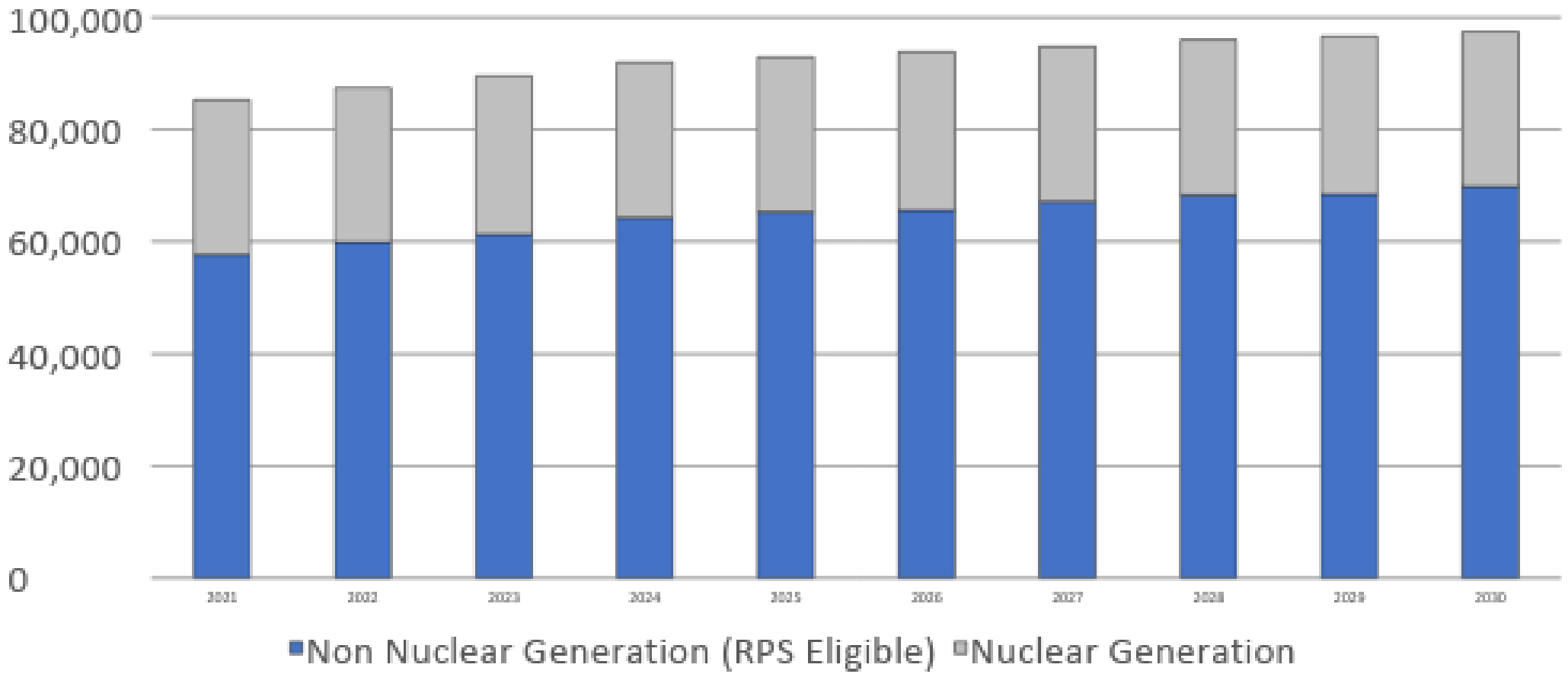
- ✓ Clean Energy Standard (CES)
- ✓ Renewable Portfolio Standard (RPS)
- ✓ Renewable Energy Certificates (RECs)
- ✓ Deficiency Payments (DPs)
- ✓ Distributed Generation (DG)

Annual RPS Program Requirements, Dominion & APCO

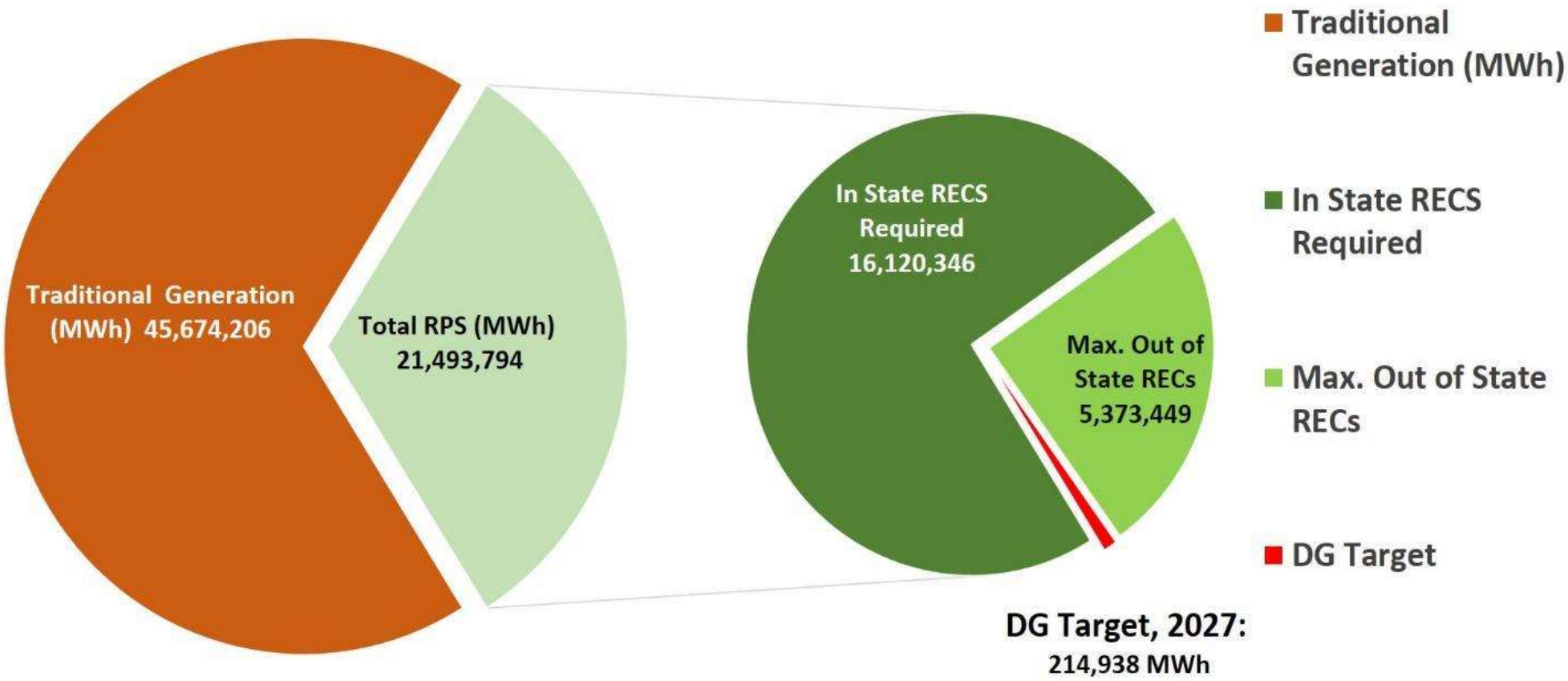
Clean Energy Standard (RPS) 2021 - 2050



Projected Annual Sales (GWh): Dominion (VA) '21-'30

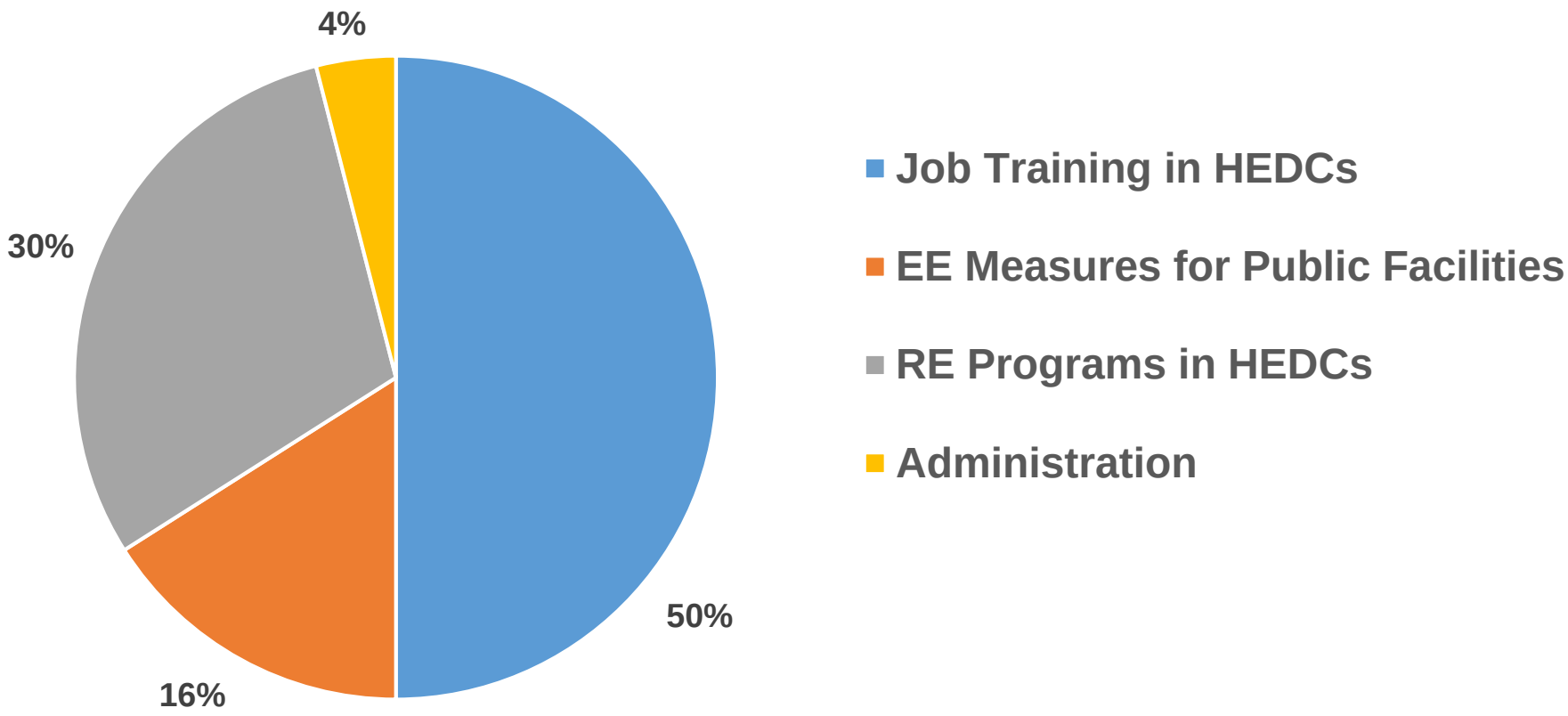


RPS Compliance Scenario for Dominion (2027)



Deficiency Payment Allocations

DMME Fund Breakdown



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Onshore Wind Opportunities in Virginia

Katharine Kollins
President

SOUTHEASTERN WIND COALITION

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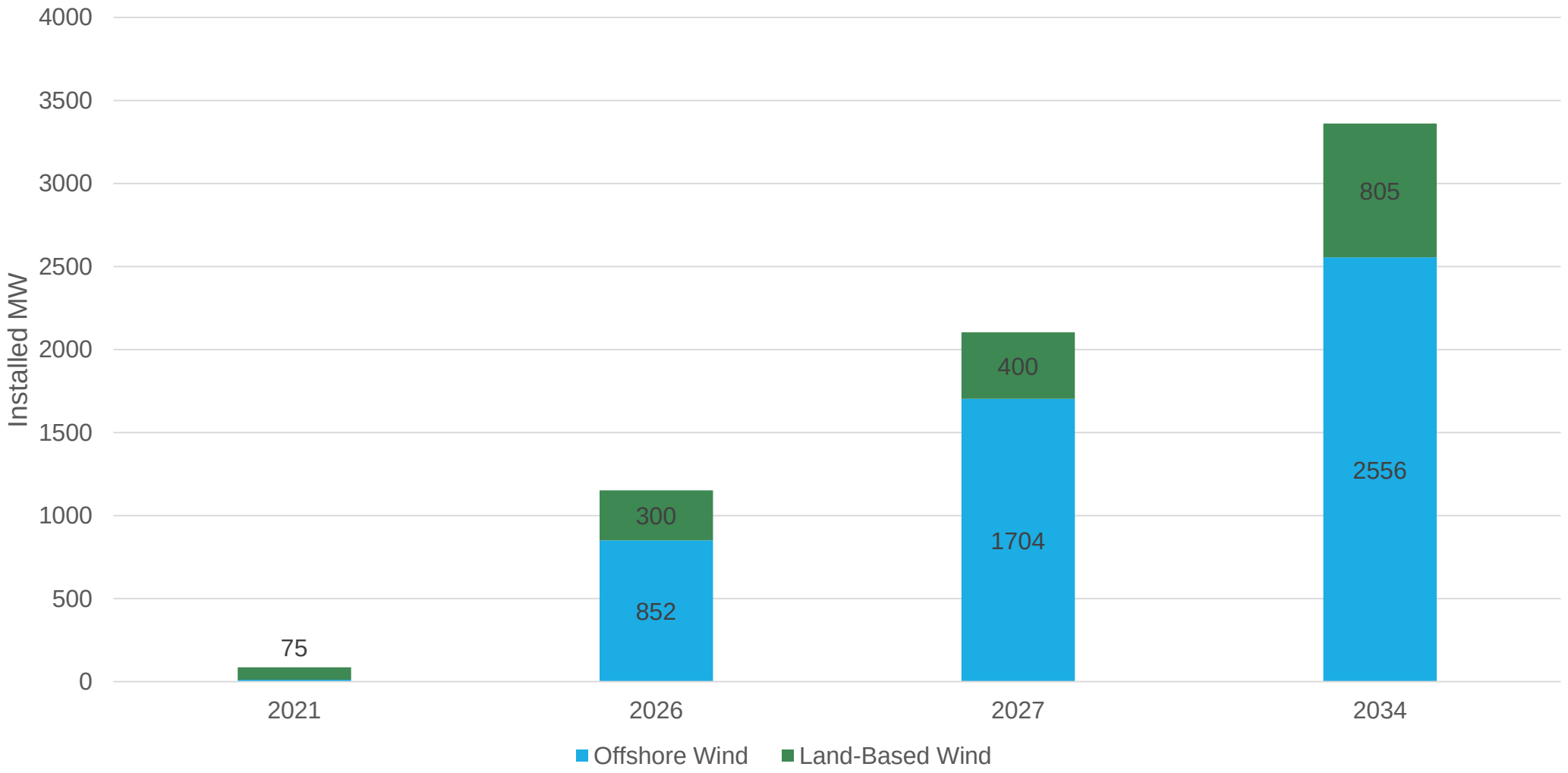
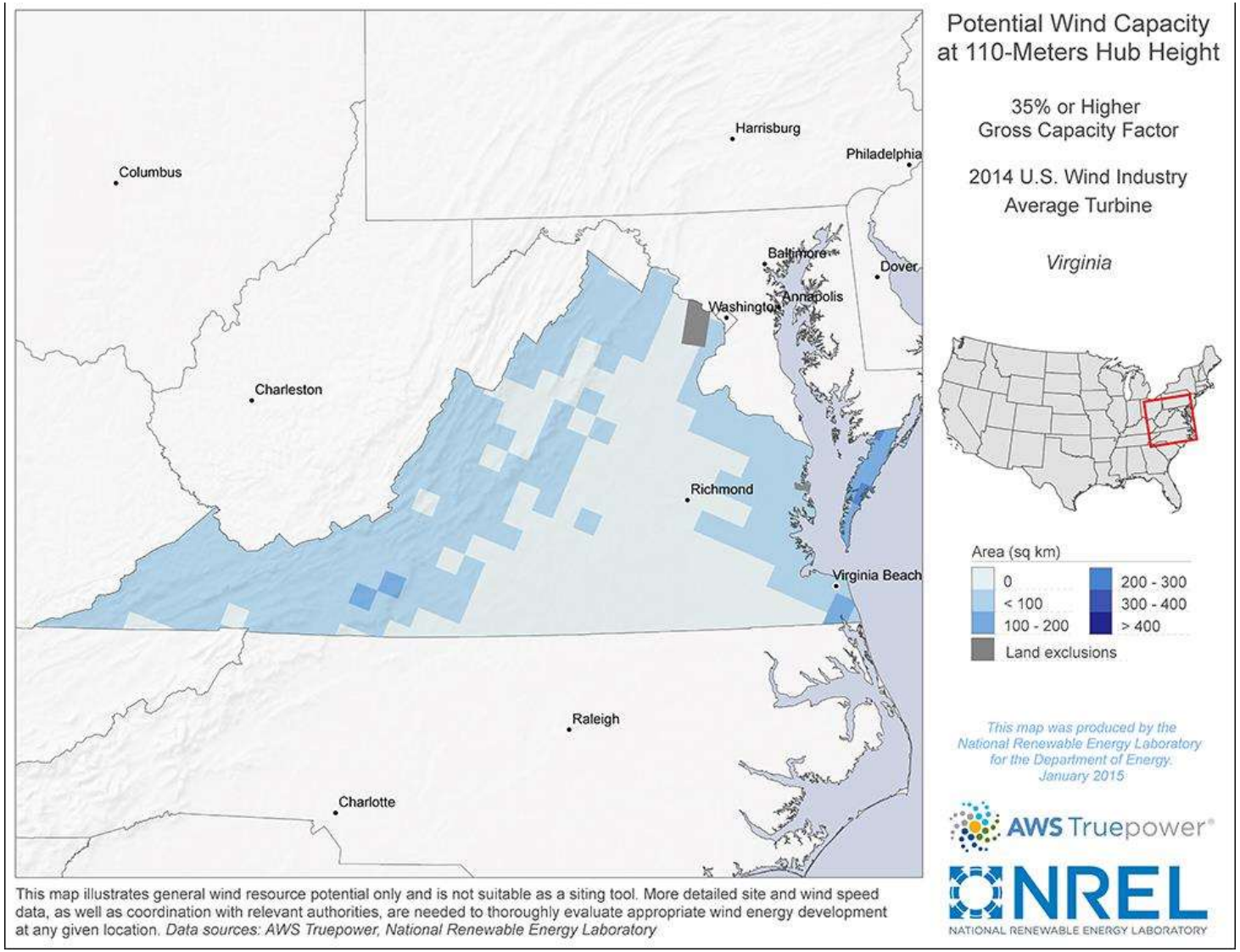
Virginia's Wind Development Forecast



**OSW Based on projections from Dominion Energy's 2020 IRP and land-based assumes 5% of VCEA 16,100MW is land-based wind



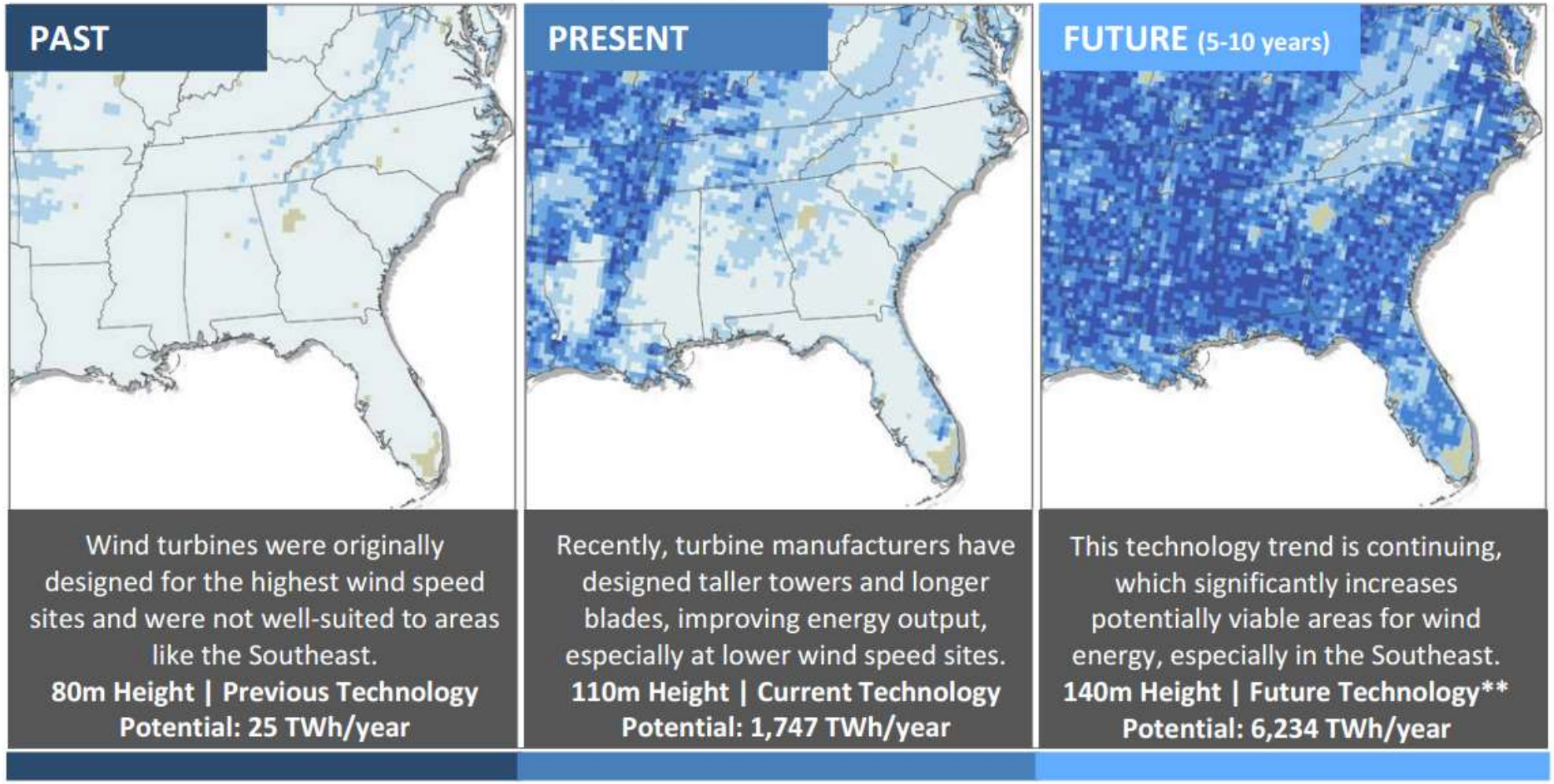
Virginia's Onshore Wind Potential

- Using currently available 110m hub height turbines, land-based wind potential in Virginia has:
  - 9,539 MW capacity potential
  - 35.2 TWh/year potential
- With future technology at 140m hub height, the potential increases to 72,000 MW

Technology Changes Open Up the Southeast

Resource Potential

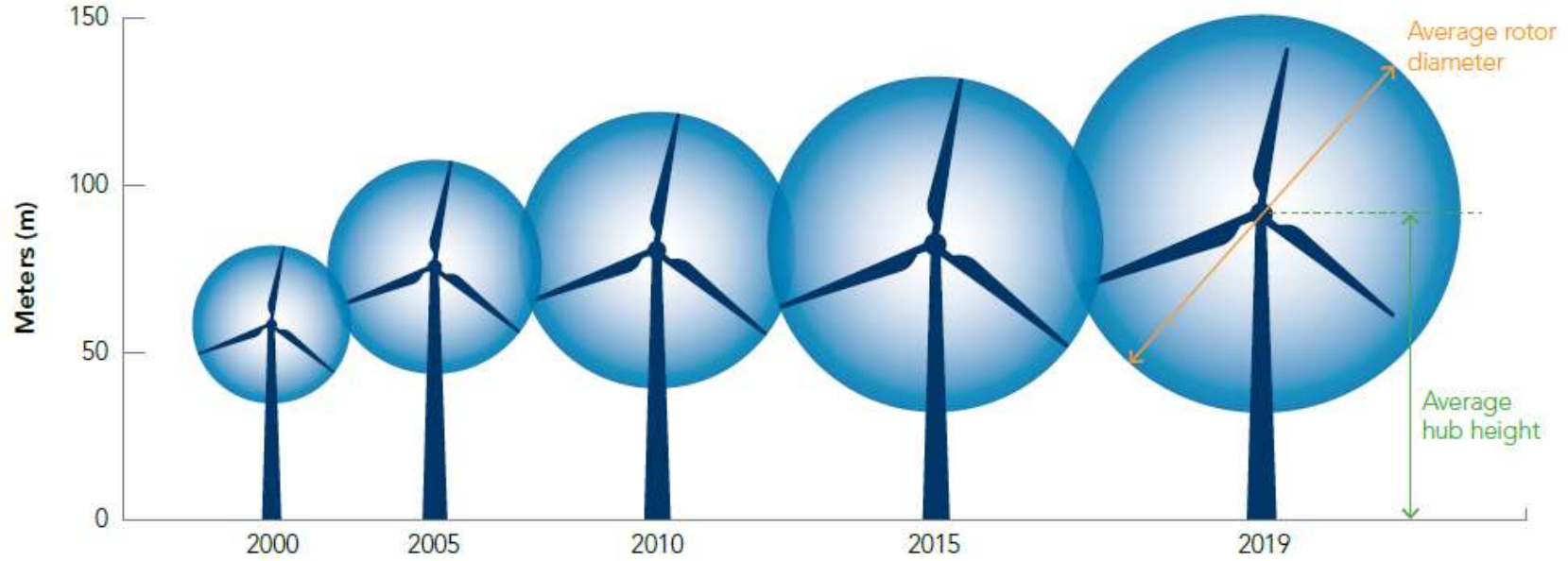
Maps below estimate areas where wind energy could be economically viable* when using available turbine technology. Not all areas shown can be developed.



PAST	PRESENT	FUTURE (5-10 years)
Wind turbines were originally designed for the highest wind speed sites and were not well-suited to areas like the Southeast. **80m Height | Previous Technology Potential: 25 TWh/year**	Recently, turbine manufacturers have designed taller towers and longer blades, improving energy output, especially at lower wind speed sites. **110m Height | Current Technology Potential: 1,747 TWh/year**	This technology trend is continuing, which significantly increases potentially viable areas for wind energy, especially in the Southeast. **140m Height | Future Technology** Potential: 6,234 TWh/year**

Evolution of the Utility-Scale Turbine

Figure 86: Evolution of the "Average" Utility-Scale Turbine

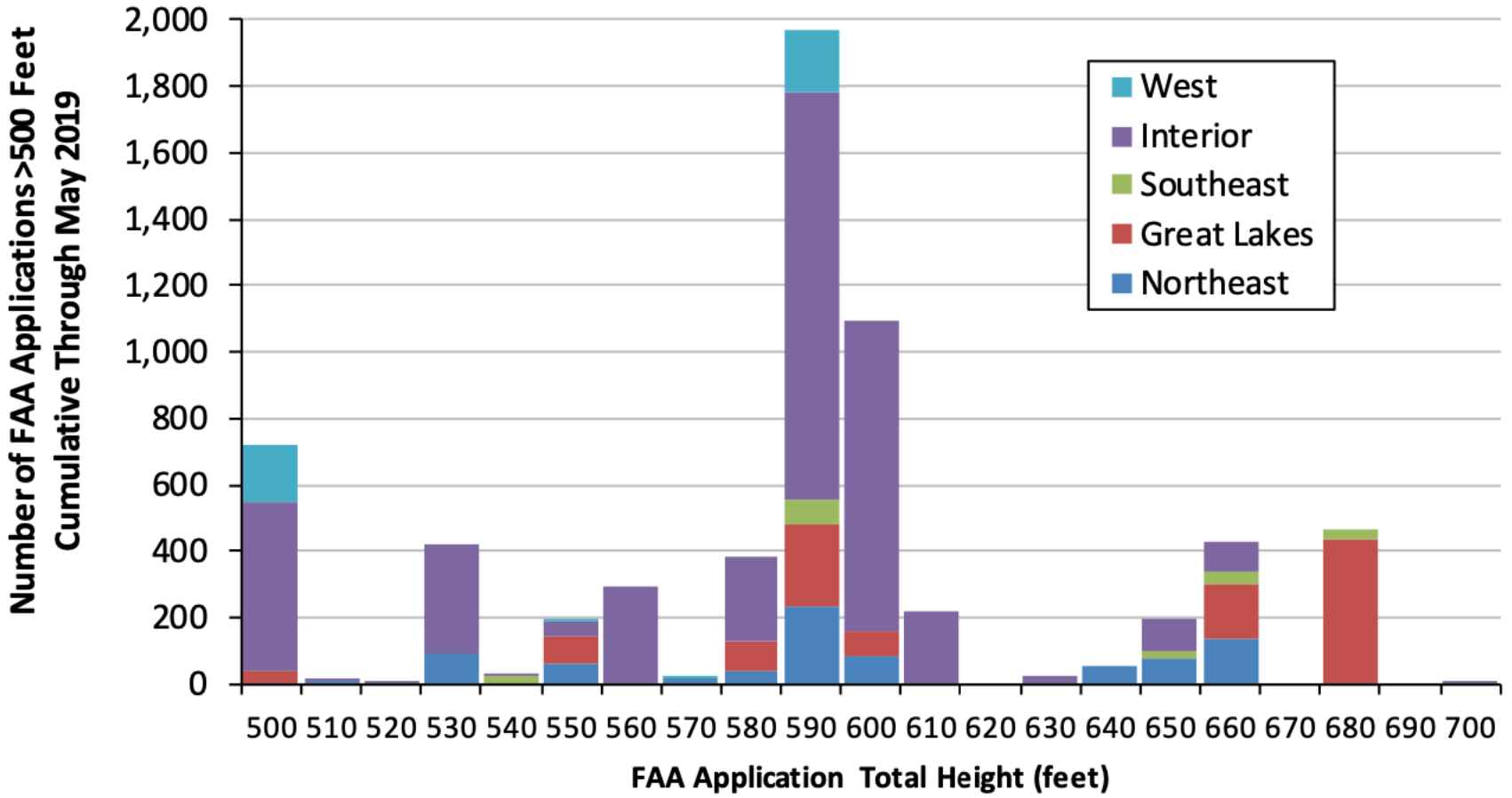


Year	Average Hub Height (m)	Average Rotor Diameter (m)
2000	58	48
2005	75	65
2010	80	84

Year	Average Hub Height (m)	Average Rotor Diameter (m)
2015	82	102
2019	90	121

Source: AWEA 2019 Annual Market Report

Turbine Height Trends



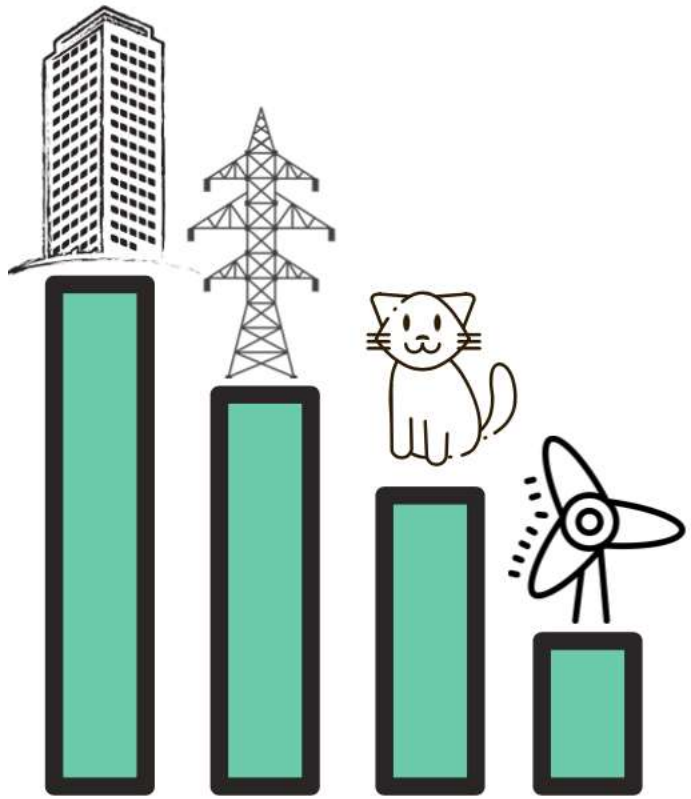
Note: Categories include turbines up to and including the height shown (e.g., 530 are turbines >520 and <=530 feet).

Source: Federal Aviation Administration

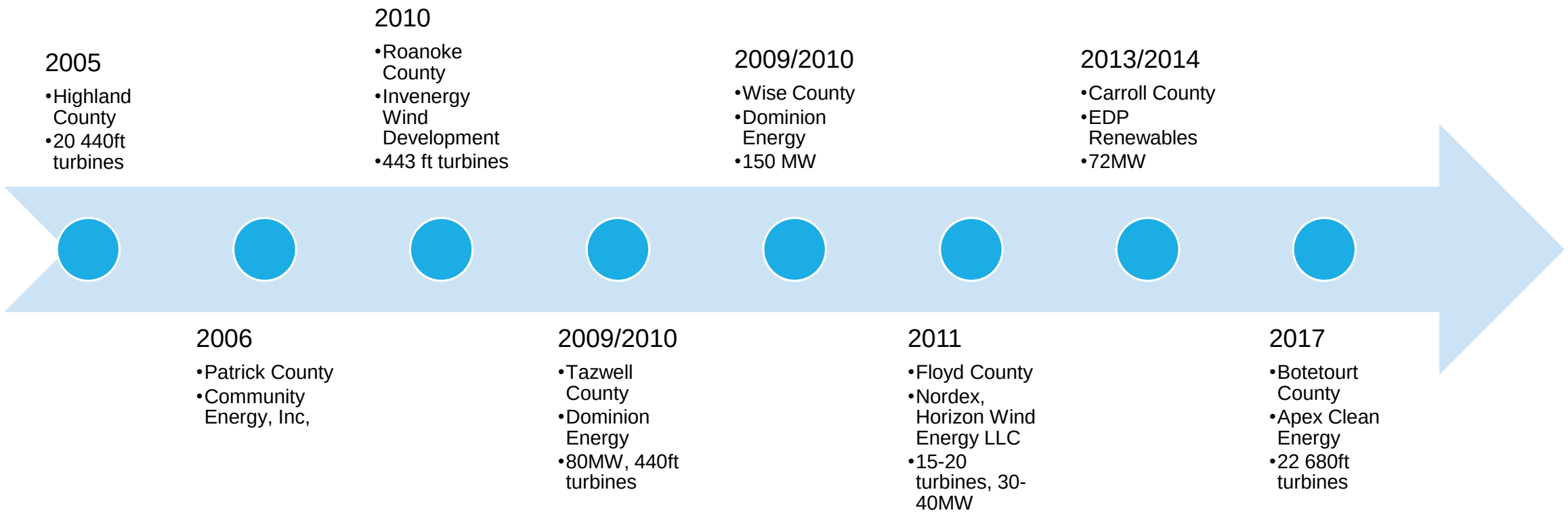
Source: AWEA 2019 Annual Market Report

Wind Policies and Permitting

- **Virginia Clean Economy Act**
  - Increases the amount of new utility-owned and utility-operated solar or onshore wind generating facilities that are in the public interest from 5,000 MWs to 16,100 MW
  - Declares 5200MW of offshore wind off the coast of Virginia in the public interest
- **DOD/FAA Permitting**
  - Department of Defense Siting Clearinghouse evaluates all wind projects for compatibility with military activities
- **VA State wind permitting**
  - Permit By Rule Process is utilized for projects below 150MW. Projects over 150MW must go before the SCC
- **Local wind permitting**
  - Counties have jurisdiction over land use and local requirements vary significantly (see appendix)
  - Wind is highly compatible with existing land use activities

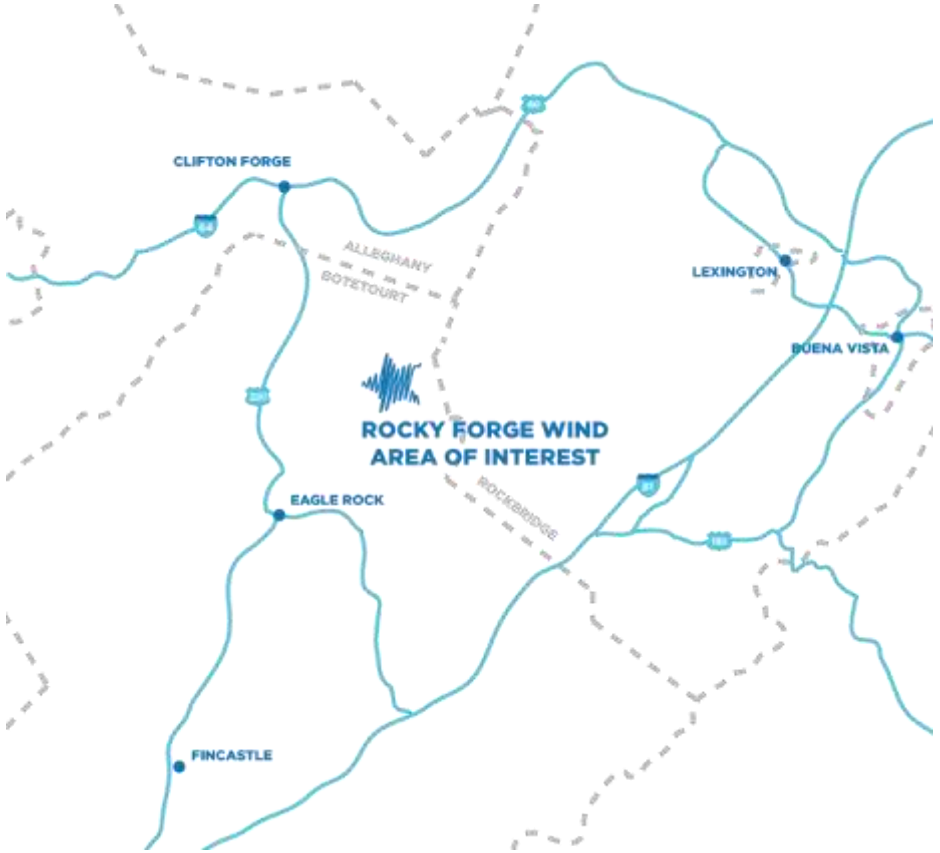


Virginia Wind Development Timeline



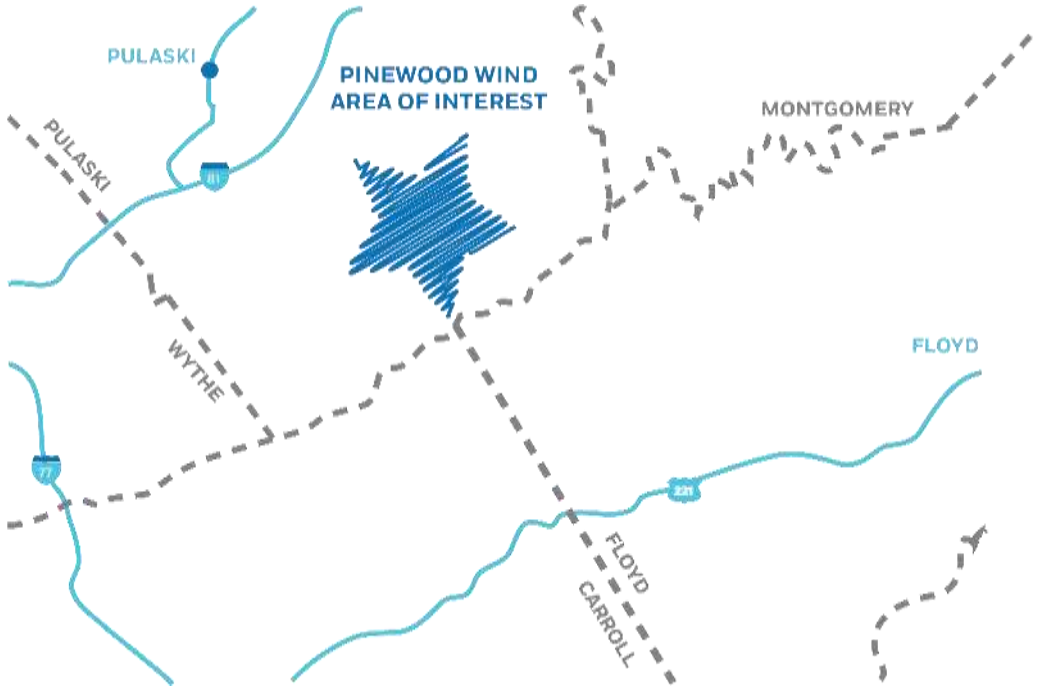
Rocky Forge by Apex Clean Energy

- 75MW project Located in Botetourt County, VA
- First wind project to be permitted under the state's Permit by Rule process
- Up to 23 680 ft turbines, leading the region in technological trends
- 250 full-time equivalent jobs during the construction phase and seven full-time permanent operations and maintenance jobs
- $25 - $30 million in county and state tax revenue over the life of the project
- In 2019 Dominion Energy agreed to purchase the electricity and then sell it to Virginia as part of a renewable energy package



Pinewood Wind by Apex Clean Energy

- Located in Pulaski County, VA
- Currently in the research phase, where Apex is working to develop a project layout and studies will continue for several years before construction can begin
- Up to 150 MW (anticipated)
- About 10 full-time jobs created for operations and maintenance
- Millions of dollars in revenue to the region over a 30-year period
- Expected to generate enough energy to power up to 40,000 homes annually



Solar Outlook in Virginia and Beyond

Maggie Clark
State Affairs Senior Manager, Southeast

SEIA Solar Energy Industries Association®

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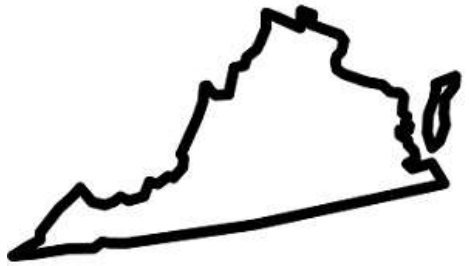
Virginia Solar Industry – COVID-19 Impacts

The COVID-19 Pandemic has caused significant economic damage to solar companies in Virginia:



- Through June of 2020, the Virginia solar industry will employ 12,804 workers, rather than the 14,819 that was originally forecasted
- The Virginia solar industry will install 292.7 megawatts (MW) of capacity in Q2 2020, 19% less solar capacity than pre-COVID forecasts

The U.S. solar industry as a whole will face significant reductions:

- Through June 2020, there will be 38% fewer solar workers nationwide than pre-COVID forecasts
- The U.S. solar industry will install just 3 GW of solar in Q2 2020, 37% less than pre-COVID forecasts
- Q2 losses will result in $3.2 billion not invested in the U.S. economy in 2020

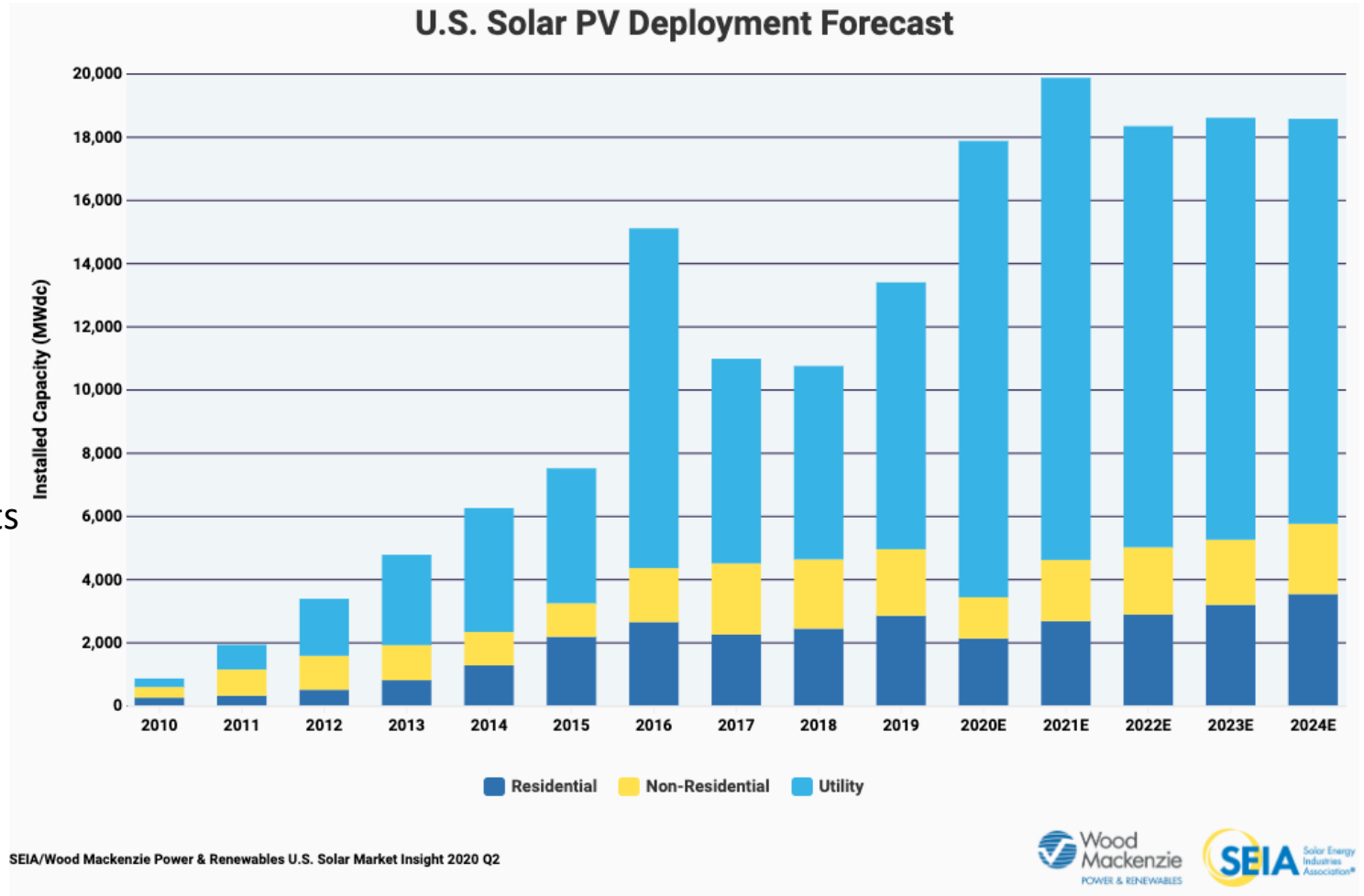
U.S. Solar PV Growth Forecast

After 2% market decline in **2018** attributed to **tariff impacts,** utility-scale growth resumed in 2019 with more than **13 GW installed.**

Coronavirus is expected to lead to a **31% decline** in 2020 **distributed markets**, but most utility-scale work has continued, and a record pipeline will carry the industry to record deployment in 2020.

Beyond 2020, the pandemic places all market segments in **considerable uncertainty**, resulting in a **downward revision of 3.6 GW** to the 2020 – 2025 forecasts.

Growth will be **contingent** on economic recovery to include consumer/business demand and financial market stability.



SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight 2020 Q2

Wood Mackenzie POWER & RENEWABLES

SEIA Solar Energy Industries Association

Virginia Department of Mines Minerals and Energy

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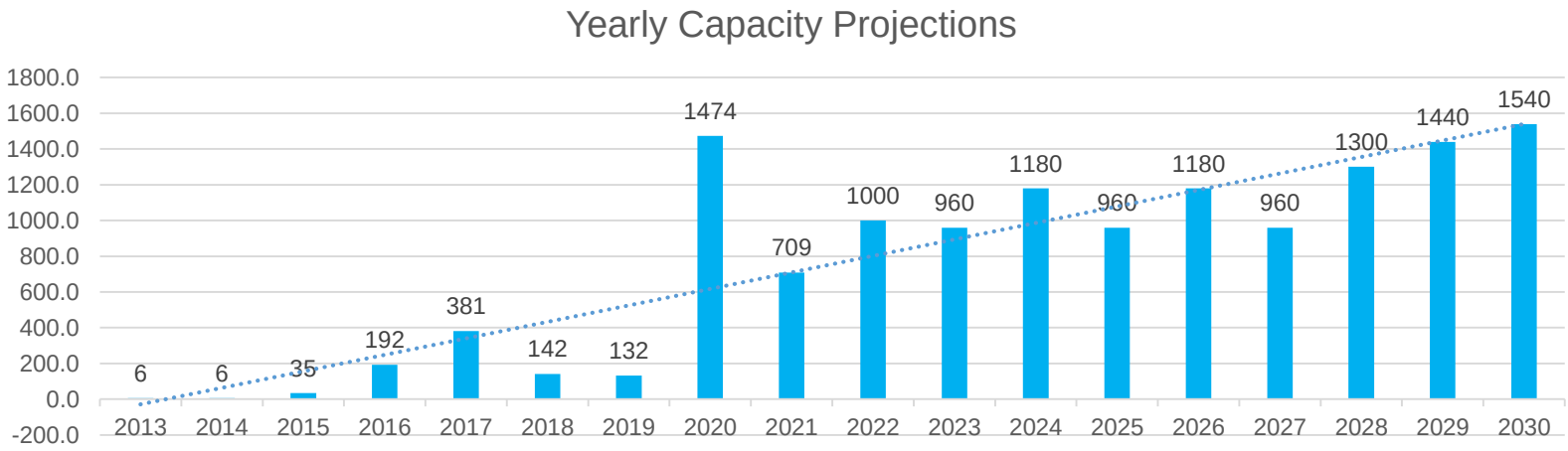
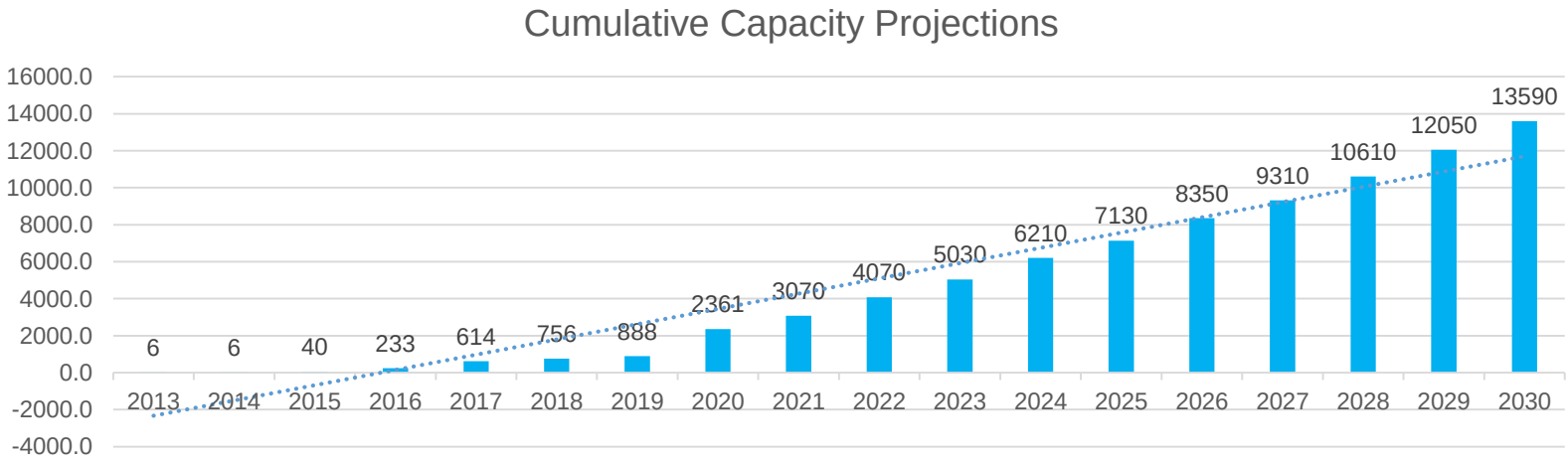
Virginia Solar Industry – Capacity Projections

The VCEA has rapidly increased projections for utility scale solar procurement during the RPS program.





Solar Land Use Policy in Virginia

Rachel Smucker

Virginia Policy and Development Manager

MDV-SEIA

Virginia Department of Mines Minerals and Energy

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2020 Utility-Scale Solar Land Use Legislation

Machinery & Tools (M&T) Tax (SB 763 / HB 1434)

- *Reduces and extends the personal property exemption for solar projects*

Revenue Share (SB 762 / HB 1131)

- *Enables counties to receive consistent revenue over the project lifetime*

Siting Agreement (HB 1675)

- *Provides greater flexibility between counties and solar developers related to voluntary payments and permitting*

MDV-SEIA

DEQ Renewable Energy Permit by Rule (PBR)

Mary E. Major

Office of Air Permit Programs

Renewable Energy Permitting

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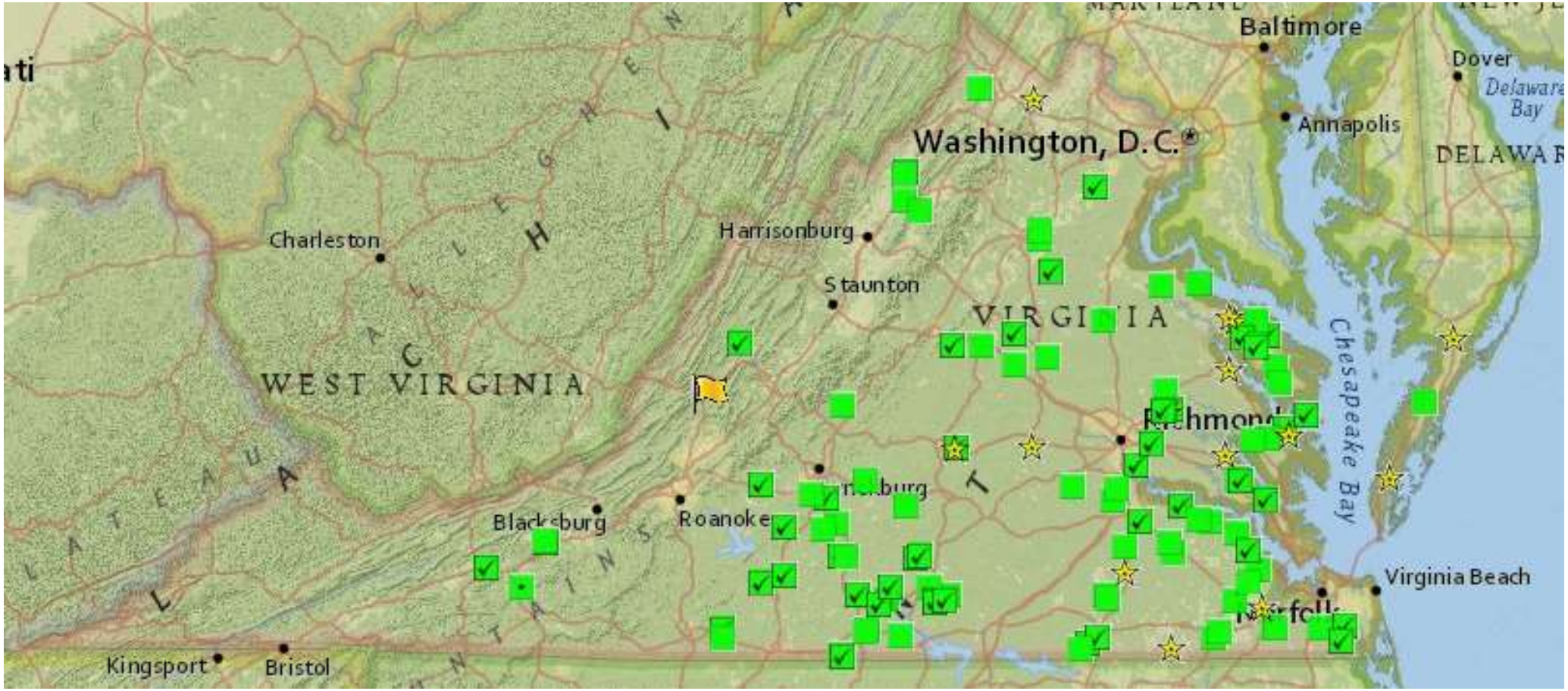
DEQ Permit by Rule (PBR) Distribution



Permit By Rule (PBR) Development

- 2009: Legislation mandated DEQ to adopt regulations for a “Permit by Rule” for renewable energy projects
- 2010: Small Renewable Energy Projects (Wind) PBR: *9VAC15-40*
- 2012: Small Renewable Energy Projects (Solar) PBR: *9VAC15-60*
- 2013: Small Renewable Energy Projects (Combustion) PBR: *9VAC15-70*

Current Regulatory Action

Virginia Town Hall
townhall.virginia.gov

Action:
"2019 Amendments Solar PBR"

Current Status:
Secretary of Natural Resources Review in process

VIRGINIA REGULATORY TOWN HALL

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Agency Department of Environmental Quality

Board Department of Environmental Quality

Chapter Small Solar Renewable Energy Projects Permit Regulation [9 VAC 15 - 60]

Guidance Documents

Chapter Information	
Description	Establishes a permit by rule for solar energy projects with rated capacity not exceeding 100 megawatts including conditions and standards necessary to protect the Commonwealth's natural resources.
State Authority	Code of Virginia Sections 10.1-1197.5 through 10.1-1197.11
Federal Authority	N/A
Exempt from APA	No, changes to this chapter are subject to the *Administrative Process Act* and the standard executive branch review process.
Text of Regulation	Link to Virginia Administrative Code
Goals of Regulation	To provide a reasonable degree of certainty and timeliness in the natural-resource protections required of solar-energy projects by setting forth, as fully as practicable, these required protections "up front" in this new permit by rule
Meetings	See all meetings (4) relating to this chapter.

Contact Information	
Name / Title:	Mary E. Major
Address:	1111 East Main Street, Suite 1400 P.O. Box 1105 Richmond, VA 23218
Email Address:	mary.major@deq.virginia.gov
Telephone:	(804)698-4423 FAX: (804)698-4510 TDD: ()-

Current Actions		
Action Title	Latest Stage	Status
2019 Amendments Solar PBR	Proposed	Secretary of Natural Resources review in progress.

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Sign up for notifications

Agency Department of Environmental Quality

Board Department of Environmental Quality

Chapter Small Solar Renewable Energy Projects Permit Regulation [9 VAC 15 - 60]

Action: 2019 Amendments Solar PBR

Proposed Stage

Action 5216 / Stage 8923

Documents		
Proposed Text	5/20/2020 3:18 pm	
Agency Background Document	3/27/2020	
Attorney General Certification	4/2/2020	
DPB Economic Impact Analysis	5/22/2020	

Status	
Exempt from APA	No, this stage/action is subject to article 2 of the *Administrative Process Act* and the standard executive branch review process.
Attorney General Review	Submitted to OAG: 3/27/2020 Review Completed: 4/2/2020 Result: Certified
DPB Review	Submitted on 4/7/2020 Review Completed: 5/22/2020 *DPB's policy memo is "Governor's Confidential Working Papers"*
Secretary Review	Secretary of Natural Resources review in progress. Day 76
Governor's Review	Not yet submitted
Virginia Registrar	Not yet submitted
Comment Period	You may comment on this stage in a Town Hall comment forum as soon as it is published in *The Virginia Register of Regulations*. If you sign up for the Town Hall email notification service, you will be notified when the comment forum opens. The regulatory information regarding this stage is subject to change until 10 days before it is published in the Register.

Solar PBR Components

15 components of the Permit By Rule

- Notice of Intent (NOI)
- Local government approval
- Interconnection studies/Final Interconnection Agreement
- Cultural, wildlife and natural heritage resources assessments
- Mitigation Plan
- Operating Plan
- Coastal avian protection zone analysis
- Site map, context map
- 30-day Public Comment Period/Public Meeting

DEQ will make determination if application is complete after sister agency consultation

- Department of Historic Resources (DHR)
- Department of Wildlife Resources *Formerly Dept. of Game and Inland Fisheries (DGIF)*
- Department of Conservation and Recreation (DCR)

DEQ must make determination within 90 days of receipt of all required documents

PBR Status as of 8/08/2020

Total Megawatts Permitted: 2,131

2015:	1 PBR	80 MW
2016:	6 PBRs	120 MW
2017:	11 PBRs	442 MW
2018:	14 PBRs	360 MW
2019:	9 PBRs	623 MW
2020:	9 PBRs	506 MW

3 PBRs in Review: 195 MW

Number of Full PBRs Issued: 50

- Solar sites permitted: 49
- Wind sites permitted: 1

Section 130 PBRs: 16

- Section 130 MW Permitted: 64 MW

PBR Summary

• Projects Operational	14
• **MW in Operation**	**407 MW**
• Projects Under Construction	4
• Total MW Under Construction	292 MW
• Notices of Intent (NOI)	58
• **Total MW Based on NOIs**	**3,309 MW**
• Total Acreage for NOIs	34,777 acres
• Permitted Acreage	26,354 acres
• ***Potential Total Acreage***	***61,131 acres***

Pollinator Friendly Development

Rene' Hypes
Project Review Coordinator
Division of Natural Heritage

DCR
Virginia Department of Conservation & Recreation

DMME
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Virginia Pollinator-Smart Solar Industry Project Team

Virginia Pollinator-Smart Solar Industry Project Team

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

- Sharon Baxter, Director, Division of Environmental Enhancement (Project Manager)
- Mary E. Major, Renewable Energy Permitting

VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION

- René Hypes, Project Review Coordinator, Division of Natural Heritage
- Kevin Heffernan, Stewardship Biologist, Division of Natural Heritage
- Jason Bulluck, Director, Division of Natural Heritage
- Chris Ludwig, Chief Biologist (retired), Division of Natural Heritage

VANASSE HANGEN BRUSTLIN, INC. (VHB)

- Kris Dramby, Director of Energy and Natural Resources
- Dr. Doug DeBerry, Senior Scientist (also Research Asst. Professor, College of William & Mary)
- Caitlin Cyrus, Botanist
- Joey Thompson, Botanist
- Dr. Samantha Alger, Pollinator Specialist (also Research Asst. Professor, University of Vermont)
- Amanda Cross, Graphic Designer

FRESH ENERGY

- Rob Davis, Director, Center for Pollinators in Energy

ERNST CONSERVATION SEEDS, INC.

- Calvin Ernst, Founder and President
- Andy Ernst, Vice President

MEADVILLE LAND SERVICE, INC./ ERNST POLLINATOR SERVICES

- Robin Ernst, President

DRAMBY ENVIRONMENTAL CONSULTING, INC.

- Shawn Dramby, President
- Linda Warren, Facilitator

POLLINATOR PARTNERSHIP

- Dr. Lora Morandin, Senior Pollinator Specialist
- Kelly Rourke, Senior Program Manager

PRAIRIE RESTORATIONS, INC.

- Ron Bowen, President

Recommended Citation Format

DeBerry, D., C. Cyrus, R. Davis, R. Ernst, A. Ernst, R. Hypes, K. Heffernan, S. Baxter, M. Major, J. Bulluck, and K. Dramby. 2019. Virginia Pollinator-Smart Solar Industry: Comprehensive Manual, Version 1.0. Virginia Department of Environmental Quality and Virginia Department of Conservation and Recreation. Natural Heritage Technical Report 19-21.

VIRGINIA'S POLLINATOR-SMART SOLAR INDUSTRY

Virginia Pollinator Smart Resources

Virginia Department of Conservation & Recreation

- ✓ Pollinator/Bird Habitat Scorecard: New or Retrofit
- ✓ Pollinator/Bird Habitat Scorecard: Established Sites, Monitoring
- ✓ Comprehensive Manual
- ✓ Monitoring Plan
- ✓ Solar Site Native Plant Finder
- ✓ Pollinator Smart Business Plan

www.pollinatorsmartva.org

Virginia Department of Mines Minerals and Energy

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Preliminary Cost Benefit Analysis – Native Veg vs Grass 100 acre facility O&M over 20 years, Midwest

Pollinator Habitat Assumptions*

- Seed: $600-$1200/acre
- $150 more/acre for planting

Mowing/maintaining

- $120/acre; $12,000/mow
- 3-4X/yr first 4 year; then 1X/yr

Low-growth Grass Assumptions*

- Seed: $300-$500/acre

Mowing/maintaining:

- $670/ac/year (includes weekly or biweekly mowing)

Pollinator habitat
20 year seed and mow costs:
Low $435K, High $519K

Grass
20 year seed and mow costs:
~$1.4M

Seed/Mow Total Cost of Pollinator Habitat Up to 3 X Less than Grass

*Source: Internal communications – MN Native Landscapes and Prairie Restorations, MN seed and planting companies

Cople Elementary School in Westmoreland County, Virginia designed by Sun Tribe Solar is the first facility in Virginia to be gold certified under a new program that encourages pollinator-friendly solar development. Gold certification is the highest pollinator-smart designation available through the voluntary program.

Potential Markets for a Virginia Native Seed Program

- Brownfields
- Reclaimed Mine Lands
- Pipeline ROWs
- Transmission ROWs
- Roadside ROWs
- Wetland Mitigation Banks
- Farms
- Parks
- Schools
- Landowners

DCR
Virginia Department of Conservation & Recreation

DCR
Virginia Department of Conservation & Recreation

VA Pollinator-Smart Resources located at

www.pollinatorsmartva.org

If you have questions, comments, or feedback, please reach out to us!

pollinator.smart@dcr.virginia.gov

National Trends, Pollinator Smart Solar

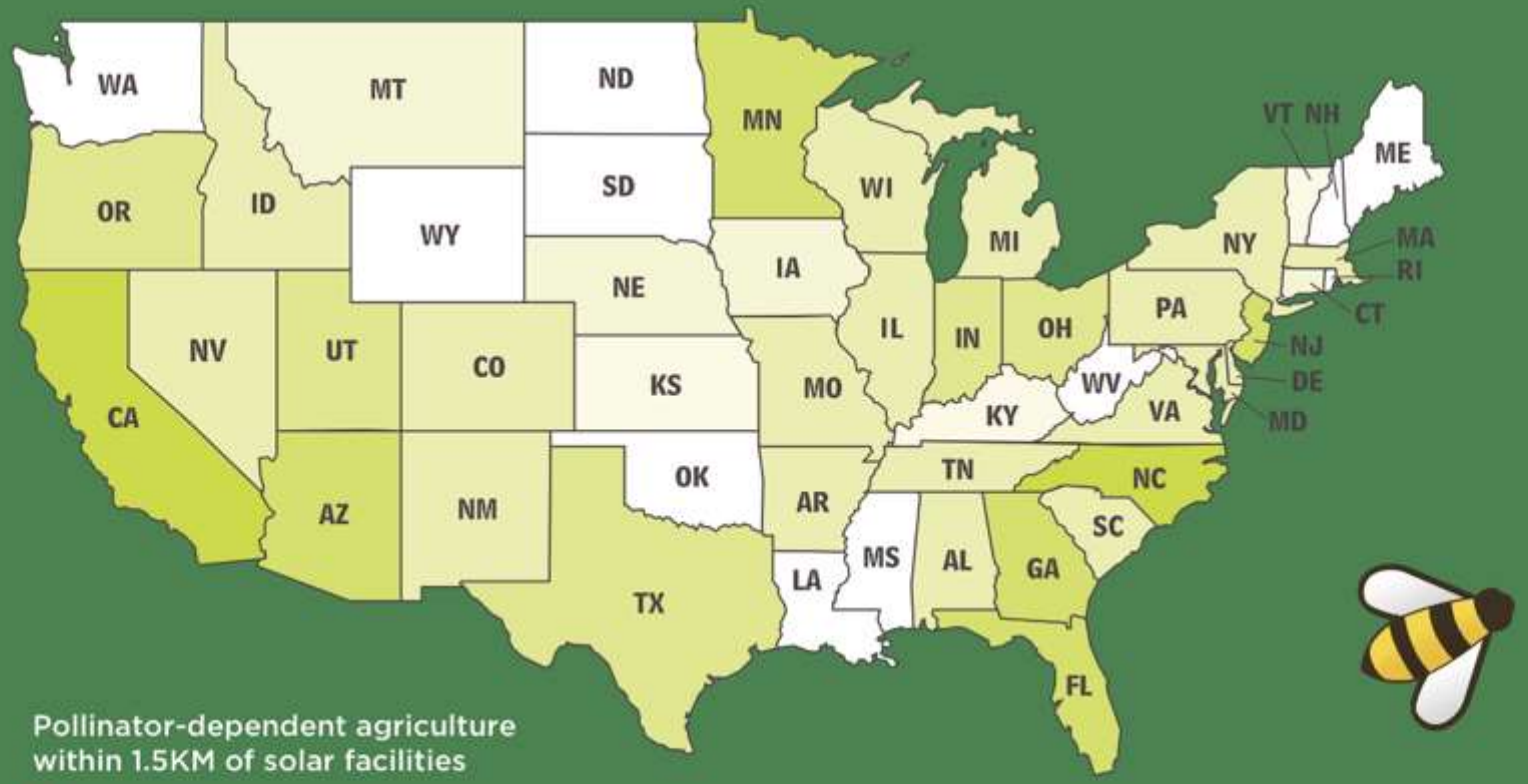
Rob Davis
Director, Center for Pollinators in Energy

Fresh Energy

Virginia Department of Mines Minerals and Energy

CLEAN ENERGY VIRGINIA

HONEY, FRUITS, AND VEGETABLES BENEFIT FROM BEING GROWN ADJACENT TO FLOWERING SOLAR FARMS



Pollinator-dependent agriculture within 1.5KM of solar facilities

- 0 – 100 hectares (ha)²
- 100 – 500
- 500 – 1,000
- 1,000 – 5,000
- 5,000 – 10,000
- 10,000 – 50,000
- 50,000 – 100,000

Pollinator-friendly solar sites would benefit many states and crops:

- **Minnesota** Honeycrisp Apples
- **Oregon** Cherries
- **California** Almonds & Melons
- **Michigan** Blueberries & Cucumbers
- **North Carolina** Pumpkins & Squash
- **Georgia** Peaches

SOURCES:
Examining the Potential for Agricultural Benefits from Pollinator Habitat at Solar Facilities in the United States. Leroy J. Walston, Shruti K. Mishra, Heidi M. Hartmann, Ihor Hlohowskyj, James McCall, and Jordan Macknick. Environmental Science & Technology 2018 52 (13), 7566-7576. DOI: 10.1021/acs.est.8b00020

Argonne NATIONAL LABORATORY

NREL

Demand is Growing for Pollinator-Friendly Solar

- Clif Bar
- Organic Valley
- Aveda
- Bank of America
- Perdue Farms
- University of Pittsburgh
- PennState
- GIANT Grocery

Engie Solar

Pollinator Friendly Solar Benefits / Questions

Benefits

- Reduce mowing frequency
- Reduced mower/solar contact
- Resilient landscaping
- Brand / enhanced reputation
- Community support
- Improve farmland soils
- Permit approval
- Reduced litigation risk
- Solar energy performance
- Reduced frost heave risk
- Benefit adjacent crops

Questions

- Unfamiliarity / training
  - Select experienced contractors
- Burn/fire risk
  - NREL shows reduced risk
- OSHA
  - Proper PPE should be used
- Endangered species act
  - CCAA and/or safe harbor
- Seed supply
  - Ample supply of native & naturalized mixes

Fresh Energy

Resources and Programs for Virginia Localities

Elizabeth Marshall
Virginia Solar Initiative

News Trends

VIRGINIA

Virginia emerges as a 'hotbed' for solar as rural counties welcome projects

Governor Northam Announces Largest State Renewable Energy Contract in the Nation

New agreement to purchase 420 megawatts of solar and wind energy follows historic month for clean energy in Virginia

Despite opposition, Matoaca solar farm project moves forward

SEPTEMBER 25, 2019

BY JIM MCCONNELL SENIOR WRITER

Culpeper mulls more rules for big solar projects

By ALLISON BROPHY CHAMPION CULPEPER STAR-EXPONENT Sep 14, 2019

SolSmart Technical Assistance

- National designation program to recognize localities for encouraging solar energy growth at all scales
- No-cost technical assistance across eight categories of local services
- Currently working across the state; recruiting in Middle Peninsula, Southside/Hampton Roads, SW 2.0
- LOCALITIES may request a consultation by completing the form at: https://dmme.virginia.gov/de/SolSmart.shtml

Eight SW Virginia communities receive SolSmart designation (2019)
Photo credit: Chelsea Barnes, Appalachian Voices

Decision Support for Localities: *SolTax Tool*

Question: How can localities maximize tax revenue from solar?

Option 1: ***Updated*** Machinery & Tools (M&T) tax

- Default option
- Exemption: 80% years 1-5, 70% years 5-10, 60% remaining years in service

Option 2: ***New*** Revenue Share Ordinance

- Must be adopted by ordinance, replaces M&T
- Assesses a flat charge of up to $1,400/MW nameplate capacity

New SolTax Tool will help localities determine best tax option

- Under Development by UVA, DMME, and key stakeholders
- Interactive tool
- Beta testing with localities this Fall

Coming Soon: Statewide Solar Survey

Virginia Department of Mines Minerals and Energy

University of Virginia
Weldon Cooper Center for Public Service

with input from the following organizations:

The Nature Conservancy

SolUnesco

vapdc virginia association of planning district commissions

Berkley Group

Virginia Association of Counties

30 Years
MDV-SEIA

DEQ Virginia Department of Environmental Quality

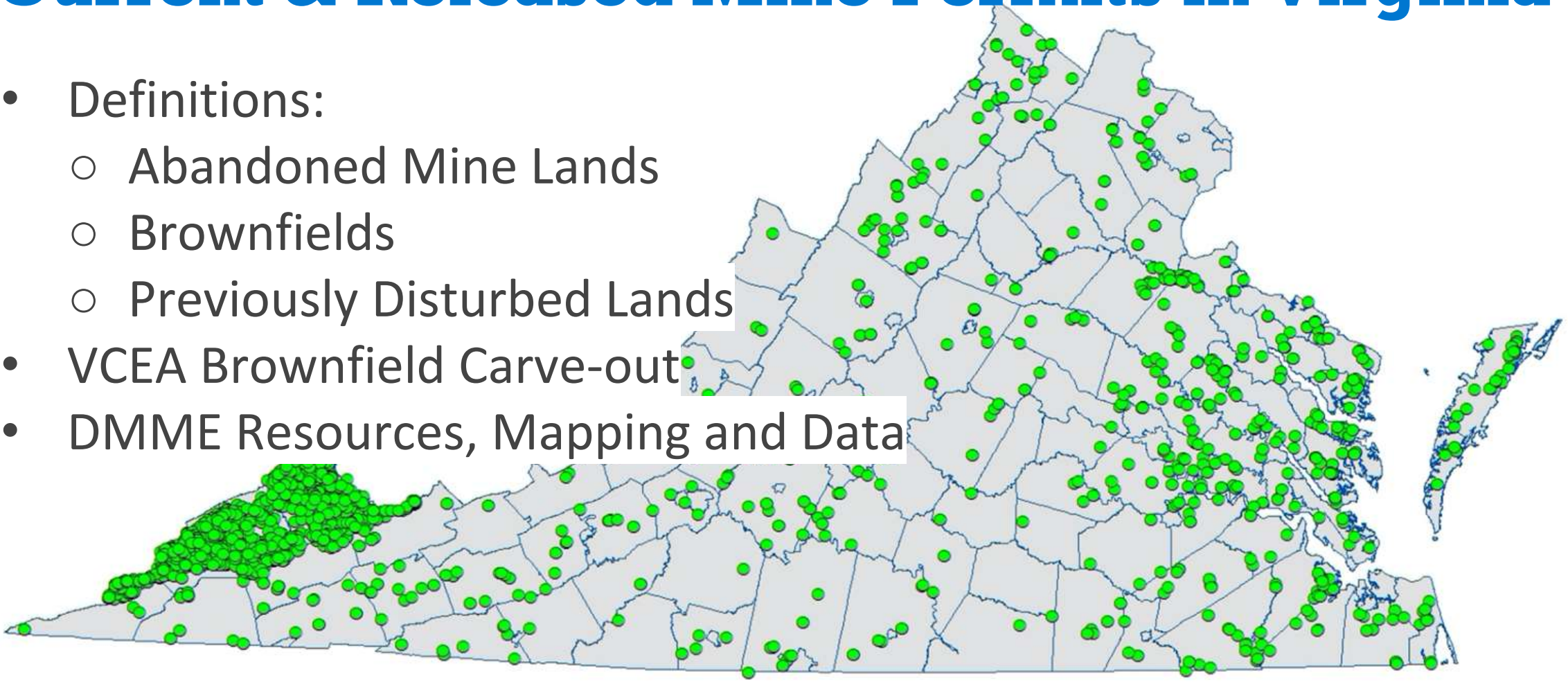
DMME Resources and Programs

Carrie Hearne

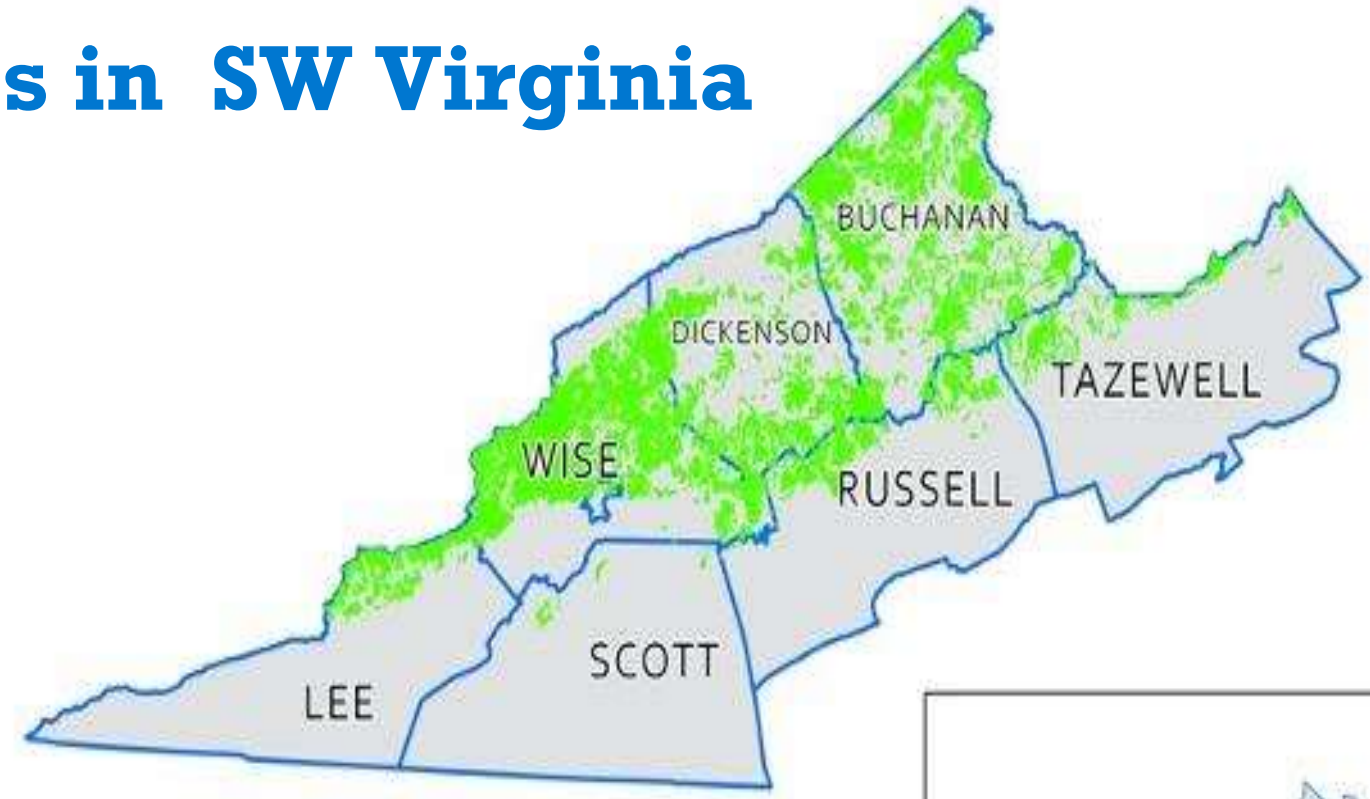
Solar Program Manager

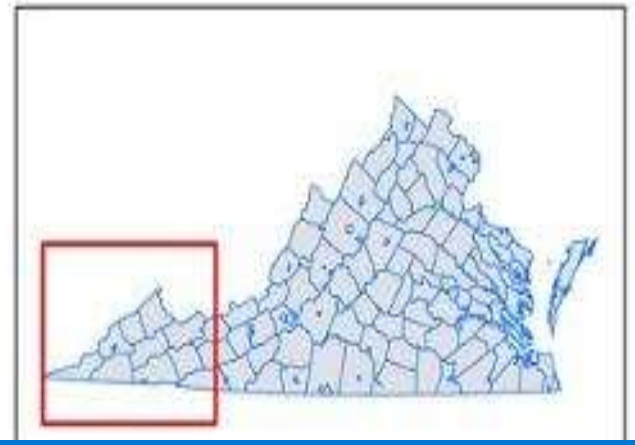
Current & Released Mine Permits in Virginia

- Definitions:
  - Abandoned Mine Lands
  - Brownfields
  - Previously Disturbed Lands
- VCEA Brownfield Carve-out
- DMME Resources, Mapping and Data



Coal Mined Lands in SW Virginia





Coalfield region development opportunities

Workforce Development Resources

NABCEP certification *encouraged* for solar companies to have at least one staff board certified
https://www.nabcep.org/

Virginia Energy Workforce Consortium
http://virginia.getintoenergy.com/

SHINE, the Solar Hands-On Instructional Network of Excellence www.shine.energy

Local Benefits and Reduction of Burdens

State Corporation Commission, DMME, and the Virginia Council on Environmental Justice (VCEJ), shall consider whether and how renewable energy programs and facilities **benefit** local workers and historically economically disadvantaged communities (HEDCs).

HEDCs: Communities where majority of population are people of color, in a low-income geographic area, veterans, or individuals located in Virginia's coalfield region near fossil fuel facilities or coal mines.

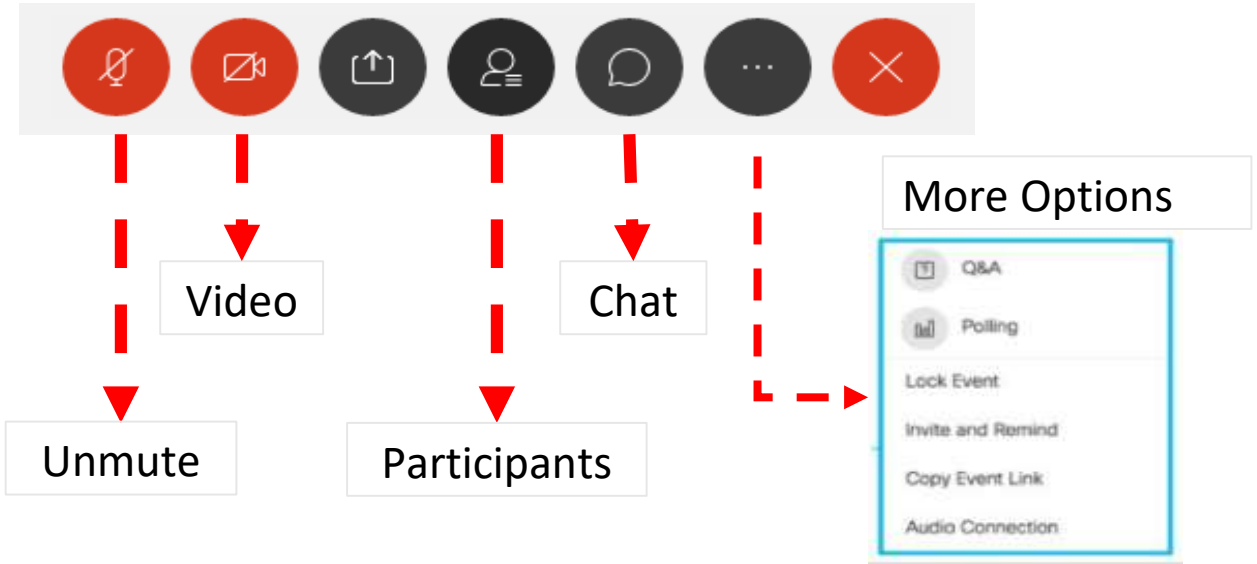
Beginning Sept 1, 2022 and every three years thereafter, DMME, in consultation with VCEJ, to determine whether VCEA imposes disproportionate **burden** on HEDCs. First report due January 2, 2023.

Audience Q&A

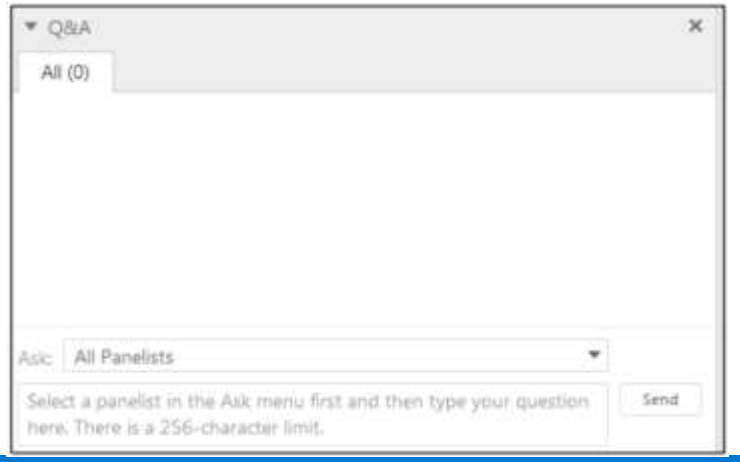
Please type your question
in the Q&A panel.

Submit Questions in Q&A on Right Panel

Navigation radials at the bottom of your WebEx Screen:



Q&A Panel on the right:



Thank you to our partners

VIRGINIA ADVANCED ENERGY ECONOMY

SOUTHEASTERN WIND COALITION

SEIA Solar Energy Industries Association®

MDV-SEIA MARYLAND | DC | DELAWARE | VIRGINIA SOLAR ENERGY INDUSTRIES ASSOCIATION

UNIVERSITY of VIRGINIA

DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Fresh Energy

DCR Virginia Department of Conservation & Recreation

DMME Virginia Department of Mines Minerals and Energy

CLEAN ENERGY VIRGINIA

Thank you for attending

Contact:

Carrie Hearne
Solar Program Manager
804-393-1979
Carrie.Hearne@DMME.Virginia.gov

APPENDIX

Appendix: Local Wind Permitting

County	Setbacks	Shadow Flicker	Noise
Botetourt	• The individual turbines cannot exceed 550 feet in height • Occupied buildings – 150%	Occupied buildings – ½ mile	60 decibels at nearest Property Line
Franklin	▪ Turbine Height ▪ Setbacks from property lines, public right-of-way, and private streets depending on facility type	NA	NA
Northampton	▪ 150% of Turbine Height	NA	▪ 55 decibels at Property Line
Pulaski	▪ Occupied Buildings – 110% ▪ Property Lines – 150% ▪ Public Roads and Rail – 150%		
Roanoke	▪ 110% of Turbine Height and at least 450ft from Property Line ▪ 1000 feet from Occupied Dwellings	NA	▪ 60 decibels at nearest Property Line
Rockingham	▪ Property Lines – 125% ▪ Residential and Public Structures – 160% and at least 800ft		▪ 60 decibels at nearest Property Line
Patrick	• Tall structures ordinance, mountain ridges – 400ft	NA	NA
Tazewell	• East River Mountain ordinance	NA	NA
Washington	▪ Turbine Height – 500ft ▪ Occupied Buildings – 160% ▪ Property Lines – 125%	NA	60 decibels at nearest Property Line

Virginia Pollinator Smart Webpage

Home » Natural Heritage » Solar Site Pollinator-Smart

Virginia Pollinator Smart

The emerging solar power industry holds in its hands an extraordinary opportunity as decision-makers, engineers and designers consider the impact of their facilities on the landscape. Expertly crafted mixes of native plants can transform a solar facility into a thriving ecosystem that supports pollinator species, birds, and other wildlife, while enhancing facility economic efficiencies.

Learn more about the benefits of native plants on solar sites...

© DCR-DNH, Gary P. Fleming.

Guidance for Establishing and Maintaining a Pollinator-Smart/Bird Habitat Solar Site

Virginia's Pollinator-Smart program is designed to provide incentives and tools for solar industry to adopt a native plant strategy to meet soil and water control regulations, community needs, and the needs of our biosphere. Below are links to supporting documents for creating pollinator-friendly habitat on a solar facility and meeting the criteria of the Pollinator-Smart certification program.

Developed with input from many stakeholders, natural resource scientists, and environmental policy experts, the materials presented here provide detailed guidance for planning, designing, installing, and maintaining a Pollinator-Smart habitat at a solar facility.

- Comprehensive Manual (Coming Soon!)
- **Vegetation Monitoring Manual** (PDF)
- **Native Plants Seed Business Plan** (PDF)
- Pollinator-Smart Scorecards
  - **New site** (PDF)
  - **Established site** (PDF)

Virginia Solar Site Native Plant Finder

The Virginia Solar Site Native Plant Finder assists users in identifying native plant species appropriate for the various vegetation requirements at a solar facility and match the needs of pollinators and birds. It also and includes information on commercial availability.

The Native Plant Finder can also help plant industry with finding native species with potential to be developed into new market commodities. Native seed suppliers are invited to share their information for inclusion in the Native Plant Finder database by emailing **pollinator.smart@dcr.virginia.gov.**

- **Solar Site Native Plant Finder**
- Plant Finder guidance is found here. [document coming soon]

Virginia Invasive Plant Species List

The DCR **Invasive Plant Species List** is the result of risk assessment conducted on hundreds of non-native plant species. The list currently identifies 90 species as invasive in Virginia. Invasive species are defined here as non-native species that cause harm to the ecosystem and native species, create economic damage and losses, or pose direct harm to humans. Invasive plant species threaten Pollinator-Smart goals if they are not properly managed at a site.

© DCR-DNH, Gary P. Fleming.

Establishing a Virginia Native Seed Industry

A goal of the Pollinator-Smart program is to kickstart a robust native seed industry that would be able to serve the coming demand for tens of thousands of acres of native plant materials. The **Native Plants Seed Business Plan** (PDF) builds on knowledge generously provided by established members of the native seed industry and outlines the steps toward a Virginia-based industry that could also serve other surrounding states.

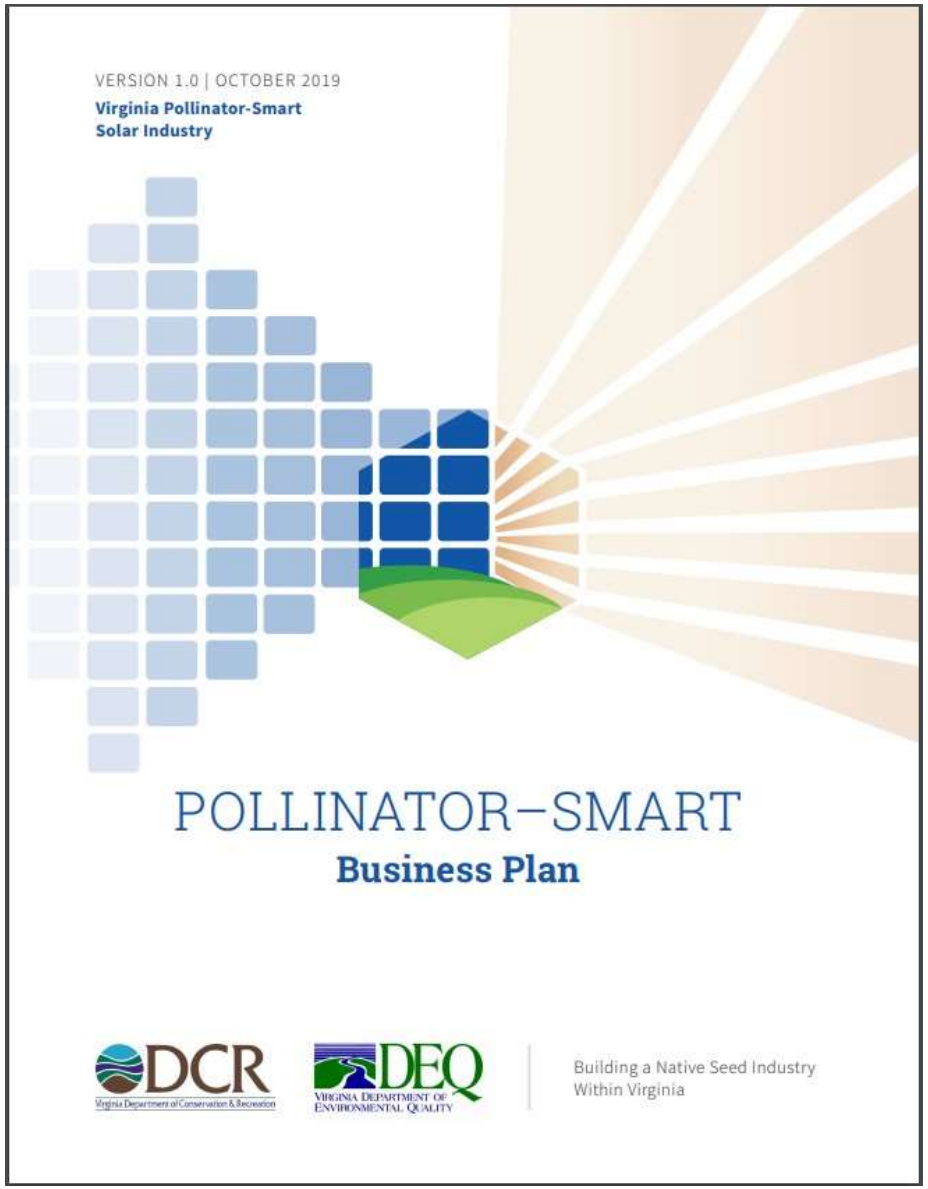
DEQ Solar Site web page

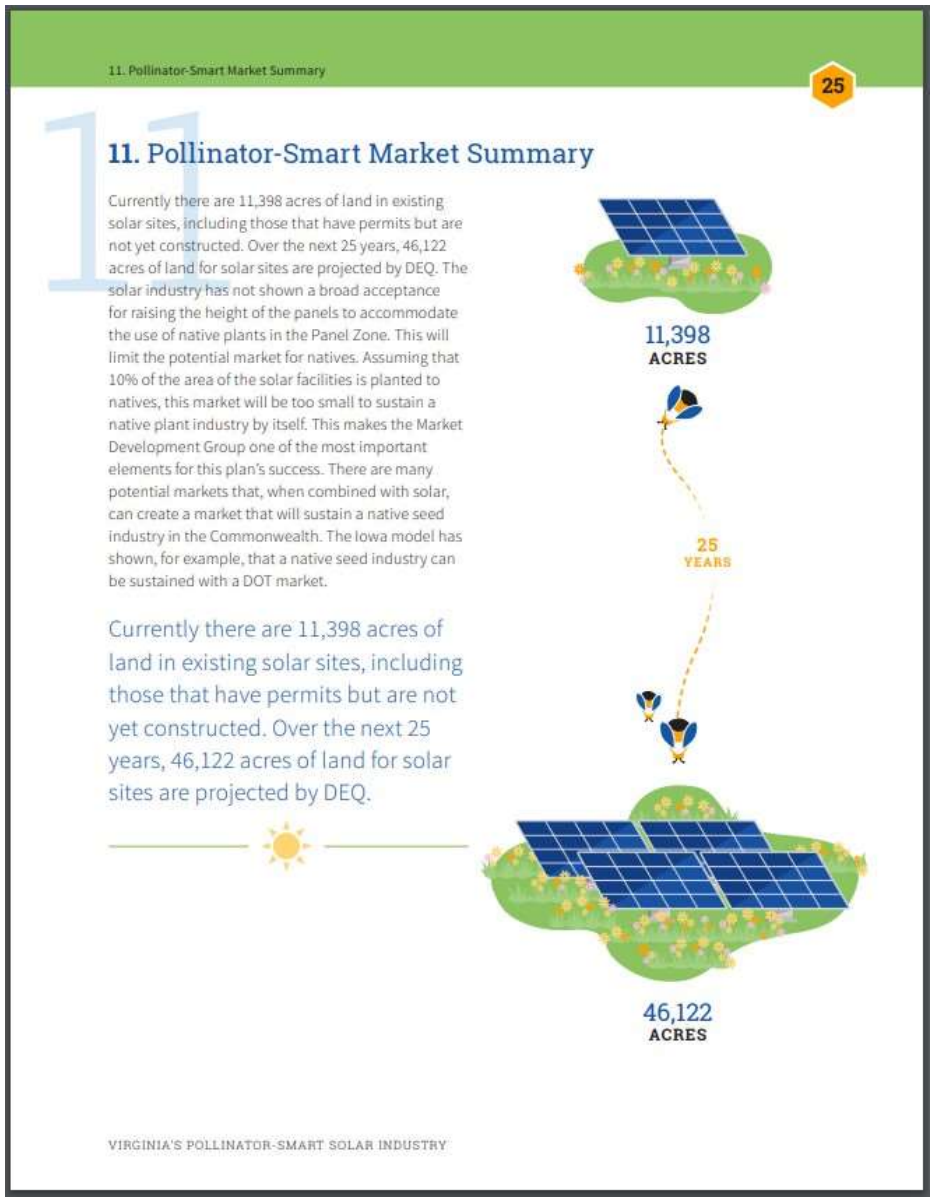
In Virginia, the Department of Environmental Quality has oversight of the establishment of solar facilities. To learn about the permit requirements and opportunities for the solar industry in Virginia, visit the **DEQ Solar Energy** page.

Questions/Comments

If you have questions or comments on the Pollinator-smart program, please contact us at **pollinator.smart@dcr.virginia.gov**

Virginia Pollinator-Smart Business Plan





Virginia Solar Site Pollinator/Bird Habitat Scorecard- New or Retrofit

VERSION 2.0a

VIRGINIA POLLINATOR-SMART/
BIRD HABITAT SCORECARD
Proposed or Retrofit Solar Sites

DEQ DCR

A successful Pollinator-Smart habitat will provide benefits to the environment and the solar site owner/operator in a number of key areas, including:

1. Pollinator services,
2. Biodiversity and habitat enhancement,
3. Carbon sequestration,
4. Erosion and sediment control, and
5. Reduced vegetation maintenance over time.

This Virginia Solar Site Pollinator/Bird Habitat Scorecard is used to establish target conditions and/or evaluate the effectiveness of Pollinator-Smart measures once implemented. If the score thresholds are met, a site is deemed Pollinator-Smart provided the activities described herein are implemented **over at least 10% of the project area**.

DEFINITIONS

Open Area: Any area beyond the panel zone, within the property boundary.

Panel Zone: The area underneath the solar arrays, including inter-row spacing.

Project Area: Open Area + Panel Zone + Screening Zone.

Screening Zone: A vegetated visual barrier.

Solar Native Plant Finder: The Virginia Solar Site Native Plant Finder (link): an online research tool developed by the DCR Natural Heritage Program.

Virginia Pollinator-Smart Seed Mix: A seed mix that includes native local ecotype and conforms with the Solar Native Plant Finder.

RESOURCES

Virginia Solar Site Native Plant Finder
Virginia's Pollinator-Smart Solar Portal
Comprehensive Manual
Monitoring Plan

INSTRUCTIONS

For detailed instructions on how to implement the scorecard, please refer to the Comprehensive Manual.

1. All questions and fields must be filled out.
2. Submit your scorecard and associated documents via email to: pollinator.smart@dcr.virginia.gov
3. A Proposed or Retrofit Solar Site Scorecard should be submitted during the initial planning year. To remain certified, an Established Site Scorecard should be submitted in years 2, 4, 6, 8, and 10. A long-term management plan should also be submitted with the Established Sites Scorecard during year 10. If all criteria are met during year 10, the site will be considered pollinator-friendly for the life of the project.

ATTACHMENTS PROVIDED

- ☐ Project Vicinity Map/Planting Plan
- ☐ Seed Mix and Seeding Rates
- ☐ Vegetation Management Plan
- ☐ Vegetation Monitoring Plan
- ☐ Invasive Species Mapping
- ☐ Research Collaboration Documentation
- ☐ Site Photos

PROJECT DETAILS & CONTACT INFORMATION

DATE:
SITE OWNER OR DESIGNEE:
PROJECT ADDRESS:
PROJECT SIZE (ACS AND MW):
POINT OF CONTACT:
EMAIL/PHONE:
VEGETATION CONSULTANT:
SEED SUPPLIER (IF KNOWN):
TARGET SEEDING DATE:

FINAL SCORE

0

Certified VA Pollinator-Smart: 80-99 pts

Gold Certified VA Pollinator-Smart: 100+ pts

CLEAR FORM

For questions, comments, and feedback, please contact pollinator.smart@dcr.virginia.gov

VERSION 2.0a

VIRGINIA POLLINATOR-SMART/
BIRD HABITAT SCORECARD
Proposed or Retrofit Solar Sites

DEQ DCR

VEGETATION

PANEL ZONE

1. Percent of panel zone to be planted with a seed mix of native species developed using the Solar Native Plant Finder (**max 15 pts**):
   - ○ <5 percent (0)
   - ○ 5-25 percent (5)
   - ○ 26-50 percent (8)
   - ○ 51-75 percent (10)
   - ○ greater than 75 percent (15)
2. Planned native grass diversity in panel zone (**max 5 pts**):
   - ○ 1 or fewer species (0)
   - ○ 2 species (2)
   - ○ 3 or more species (5)

OPEN AREA

3. Percent of open area to be planted with Virginia Pollinator-Smart Seed Mix developed using the Solar Plant Finder (**max 15 pts**):
   - ○ <5 percent (0)
   - ○ 5-25 percent (5)
   - ○ 26-50 percent (8)
   - ○ 51-75 percent (10)
   - ○ greater than 75 percent (15)
4. Total number of Solar Native Plant Finder species in the seed mix to be used within the open area (**max 15 pts**):
   - ○ 4 or fewer species (0)
   - ○ 5-9 species (5)
   - ○ 10-14 species (8)
   - ○ 15-19 species (10)
   - ○ 20 or greater species (15)
5. For the seed mix to be used within the open area, seasons with at least three (3) Solar Native Plant Finder species in flower (**max 10 pts**) (**CHECK ALL THAT APPLY**):
   - ☐ Spring (March-May) (2)
   - ☐ Early Summer (June-July 15) (2)
   - ☐ Late Summer (July 15-August) (4)
   - ☐ Fall (September-November) (2)

SCREENING ZONE

6. Within the screening zone, percent to be planted with Solar Native Plant Finder species (**max 15 pts**):
   - ○ <5 percent (0)
   - ○ 5-25 percent (5)
   - ○ 26-50 percent (8)
   - ○ 51-75 percent (10)
   - ○ greater than 75 percent (15)

SITE MANAGEMENT

PLANNING AND MAINTENANCE PRACTICES

7. (**CHECK ALL THAT APPLY**) (**max 25 pts**):
   - ☐ Site has an Approved* Vegetation Management Plan (15)
   - ☐ Vegetation monitoring* is proposed annually (5)
   - ☐ Invasive species mapping and control proposed annually (5)
   - ☐ Planned pre-site use of insecticide or pre-planting seed/plant insecticide treatment (excluding buildings/electrical boxes, etc.) (-40)

INVASIVE SPECIES RISK

8. (**CHECK ALL THAT APPLY**) (**-20 pts possible**):
   - ☐ Combined cover of tall fescue across all three zones planned to be >10 percent (-10)
   - ☐ Combined cover of species on Old Virginia Invasive Plant Species List across all three zones planned to be >10 percent (-10)

PUBLIC ENGAGEMENT AND RESEARCH

9. (**CHECK ALL THAT APPLY**) (**max 10 pts**):
   - ☐ 1 or more legible and accessible signs identifying pollinator and bird habitat proposed on site (2.5)
   - ☐ Accessible bench and educational display proposed on site (2.5)
   - ☐ Research collaboration with college, university, school, or research institute (5)

POLLINATOR/BIRD NESTING HABITAT ON-SITE

10. (**CHECK ALL FEATURES THAT ARE PRESENT ON-SITE**) (**20+ pts**):
    - ☐ Existing bare ground patches one square foot or larger, with undisturbed and well-drained soil (2)
    - ☐ Preserved upland treelined communities or forest edge habitat that includes native flowering shrubs and young trees (8)
    - ☐ Cavity nesting sites (e.g. dead trees, snags, fallen logs, shrubs, plants with pithy-stemmed forgs such as native sumacs, roses, blackberries) (2)
    - ☐ Created bare/dirt nesting habitat features (e.g., bowls, tunnels, etc.) (0.2 pts per feature)* # features: x 0.2 = 0 pts.
    - ☐ Preserved wetland communities/presence of clean water source(s) (8)

*See guidelines for development of a Vegetation Management Plan here. Vegetation Management Plans for solar sites are sponsored by the Virginia Pollinator-Smart Solar Industry Review Board. Vegetation Management Plans may be submitted here.

*Vegetation monitoring should be conducted in accordance with the methods described here. For the purposes of compliance, monitoring is only required every two years; therefore, annual monitoring is inconsistent with additional points in the Scorecard.

*Up to a maximum of 10 points (50 features).

Virginia Solar Site Pollinator/Bird Habitat Scorecard Established Sites-Monitoring

VERSION 2.0b

VIRGINIA POLLINATOR-SMART/
BIRD HABITAT SCORECARD
Established Solar Sites

A successful Pollinator-Smart habitat will provide benefits to the environment and the solar site owner/operator in a number of key areas, including:

1. Pollinator services,
2. Biodiversity and habitat enhancement,
3. Carbon sequestration,
4. Erosion and sediment control, and;
5. Reduced vegetation maintenance over time.

The Virginia Solar Site Pollinator/Bird Habitat Scorecard is used to establish target conditions and/or evaluate the effectiveness of Pollinator-Smart measures once implemented. If the score thresholds are met, a site is deemed Pollinator-Smart.

DEFINITIONS

Open Area: Any area beyond the panel zone, within the property boundary.

Panel Zone: The area underneath the solar arrays, including inter-row spacing.

Screening Zone: A vegetated visual barrier.

Solar Native Plant Finder: The Virginia Solar Site Native Plant Finder (link), an online research tool developed by the DCR Natural Heritage Program.

Used by Pollinators: Plant species with a "pollinator" designation on the Virginia Solar Site Native Plant Finder.

RESOURCES

Virginia Solar Site Native Plant Finder

Virginia's Pollinator-Smart Solar Portal

Comprehensive Manual

Monitoring Plan

INSTRUCTIONS

For detailed instructions on how to implement the scorecard, please refer to the Comprehensive Manual.

1. All questions and fields must be filled out.
2. Submit your scorecard and associated documents via email to: pollinator.smart@dcr.virginia.gov
3. A Proposed or Retrofit Solar Site Scorecard should be submitted during the initial planting year. To remain certified, an Established Sites Scorecard should be submitted in years 2, 4, 6, 8, and 10. A long-term management plan should also be submitted with the Established Sites Scorecard during year 10. If all criteria are met during year 10, the site will be considered pollinator-friendly for the life of the project.

ATTACHMENTS PROVIDED

- ☐ Project Vicinity Map
- ☐ Vegetation Management Plan
- ☐ Vegetation Monitoring Report
- ☐ Invasive Species Mapping
- ☐ Research Collaboration Documentation
- ☐ Site Photos
- ☐ Long-term management plan (Year 10 only)

PROJECT DETAILS & CONTACT INFORMATION

DATE:

SITE OWNER OR DESIGNEE:

PROJECT ADDRESS:

PROJECT SIZE (ACS AND MW):

POINT OF CONTACT:

EMAIL/PHONE:

VEGETATION CONSULTANT:

FINAL SCORE

0

Certified VA Pollinator-Smart: 80-99 pts

Gold Certified VA Pollinator-Smart: 100+ pts

CLEAR FORM

For questions, comments, and feedback, please contact pollinator.smart@dcr.virginia.gov

VERSION 2.0b

VIRGINIA POLLINATOR-SMART/
BIRD HABITAT SCORECARD
Established Solar Sites

VEGETATION

PANEL ZONE

1. Percent of overall existing cover in the panel zone vegetated with Solar Native Plant Finder species (**max 15 pts**)
   - ○ <5 percent (0)
   - ○ 5-25 percent (5)
   - ○ 26-50 percent (8)
   - ○ 51-75 percent (10)
   - ○ greater than 75 percent (15)
2. Native grass diversity in panel zone (**max 5 pts**)
   - ○ 1 or fewer species (0)
   - ○ 2 species (2)
   - ○ 3 or more species (5)

OPEN AREA

3. Percent of overall existing cover within the open area vegetated with Solar Native Plant Finder species used by pollinators (**max 15 pts**)
   - ○ <5 percent (0)
   - ○ 5-25 percent (5)
   - ○ 26-50 percent (8)
   - ○ 51-75 percent (10)
   - ○ greater than 75 percent (15)
4. Total number of Solar Native Plant Finder species found within the open area (**max 15 pts**)
   - ○ 9 or fewer species (0)
   - ○ 10-19 species (5)
   - ○ 20-29 species (8)
   - ○ 30-39 species (10)
   - ○ 40 or greater species (15)
5. Within the open area, seasons with at least three (3) Solar Native Plant Finder species in flower (**max 10 pts**) **[CHECK ALL THAT APPLY]**
   - ☐ Spring (March-May) (2)
   - ☐ Early Summer (June-July 15) (2)
   - ☐ Late Summer (July 15-August) (4)
   - ☐ Fall (September-November) (2)

SCREENING ZONE

6. Percent of overall existing cover in the screening area vegetated with Solar Native Plant Finder species (**max 15 pts**)
   - ○ <5 percent (0)
   - ○ 5-25 percent (5)
   - ○ 26-50 percent (8)
   - ○ 51-75 percent (10)
   - ○ greater than 75 percent (15)

SITE MANAGEMENT

PLANNING AND MAINTENANCE PRACTICES

7. **[CHECK ALL THAT APPLY]** (**max 25 pts**)
   - ☐ Site has an Approved[1] Vegetation Management Plan (15)
   - ☐ Vegetation monitoring[2] conducted annually (5)
   - ☐ Invasive species mapping and control conducted annually (5)
   - ☐ On-site use of insecticide (excluding safety/hazard spot treatment around buildings/electrical boxes, etc.) (-40)

INVASIVE SPECIES RISK

8. **[CHECK ALL THAT APPLY]** (**-20 pts possible**)
   - ☐ Combined cover of tall fescue across all three zones >10 percent (-10)
   - ☐ Combined cover of species on DNH Virginia Invasive Plant Species List across all three zones >10 percent (-10)

PUBLIC ENGAGEMENT AND RESEARCH

9. **[CHECK ALL THAT APPLY]** (**max 10 pts**)
   - ☐ 2 or more legible and accessible signs identifying pollinator and bird habitat present on-site (2.5)
   - ☐ Accessible bench and educational display present on-site (2.5)
   - ☐ Research collaboration with college, university, school, or research institute (5)

POLLINATOR/BIRD NESTING HABITAT ON-SITE

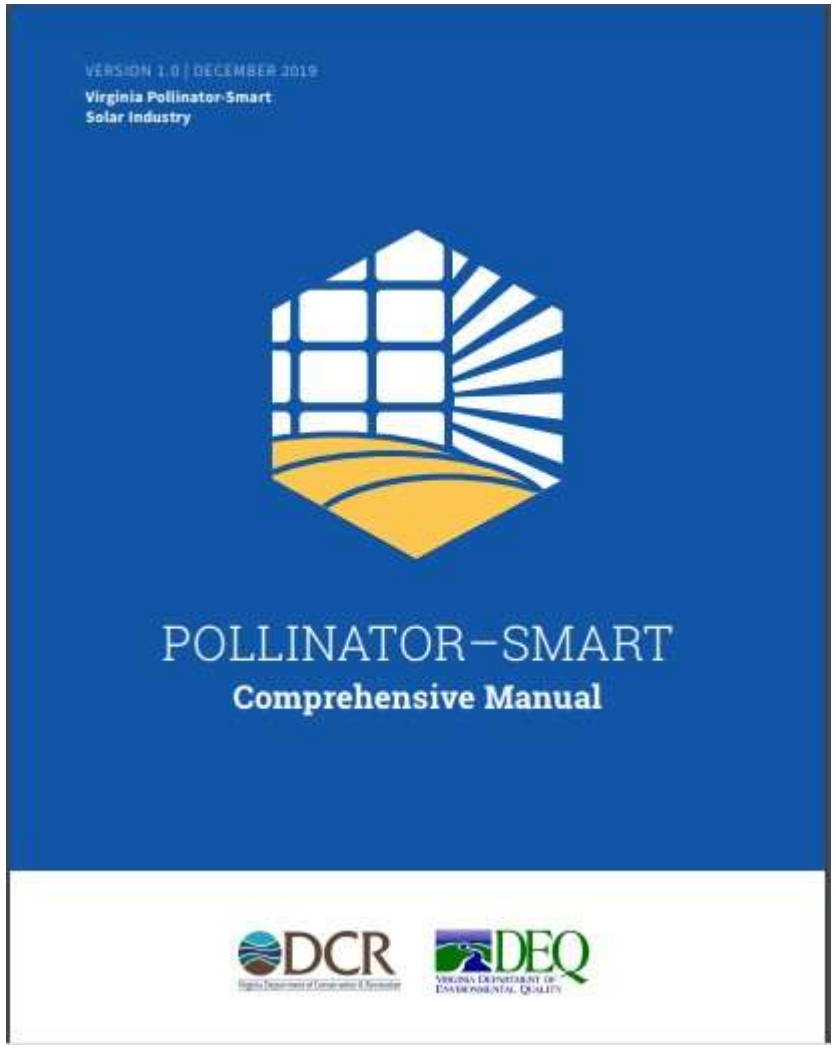
10. **[CHECK ALL FEATURES THAT ARE PRESENT ON-SITE]** (**20+ pts**)
    - ☐ Existing bare ground patches one square foot or larger, with undisturbed and well-drained soil (2)
    - ☐ Preserved upland forested communities or forest edge habitat that includes native flowering shrubs and young trees (8)
    - ☐ Cavity nesting sites (e.g. dead trees, snags, fallen logs, shrubs, plants with pithy-stemmed twigs such as native sumacs, roses, or blackberries) (2)
    - ☐ Created bee/bird nesting habitat features (e.g., boxes, tunnels, etc.) (0.2 pts per feature)[3] # feature: x 0.2 = 0 pts.
    - ☐ Preserved wetlands communities/presence of clean water source(s) (8)

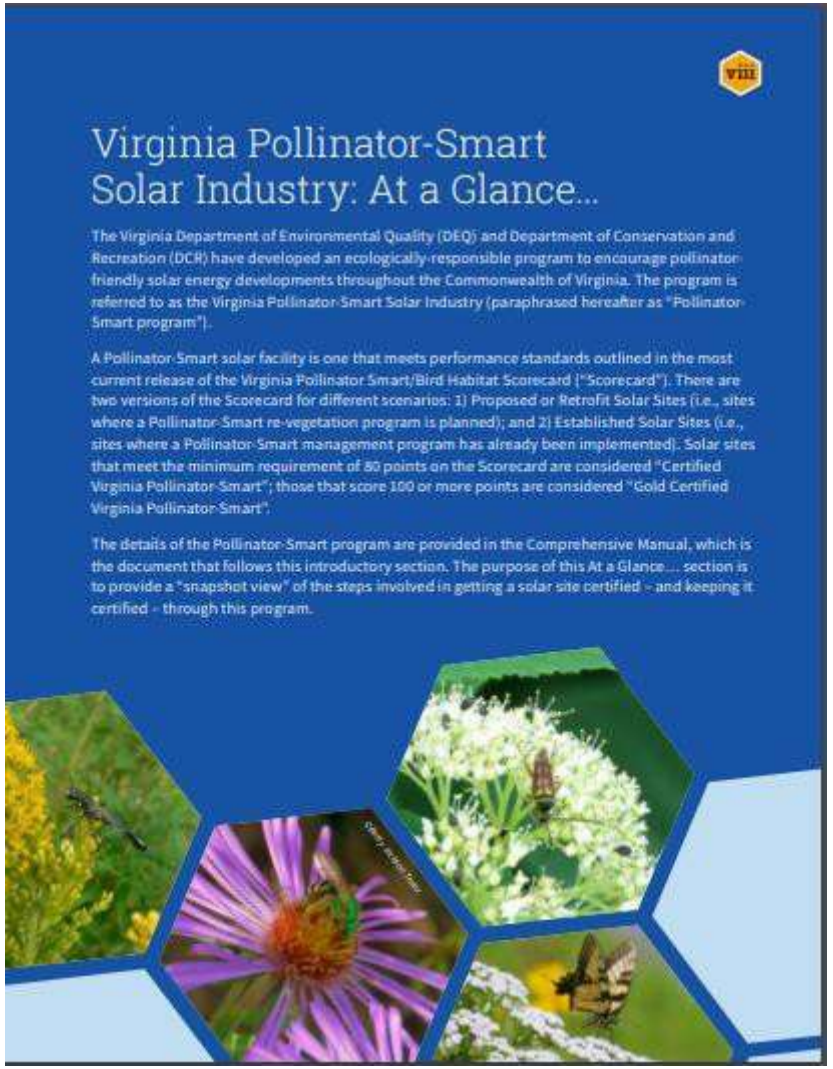
[1] *See guidelines for development of a Vegetation Management Plan here. Vegetation Management Plans for solar sites are approved by the Virginia Pollinator-Smart Solar Industry Review Board. Vegetation Management Plans may be submitted here.*

[2] *Vegetation monitoring should be conducted in accordance with the methods described here. For the purposes of compliance, monitoring is only required every two years; therefore, annual monitoring is incentivized with additional points in the Scorecard.*

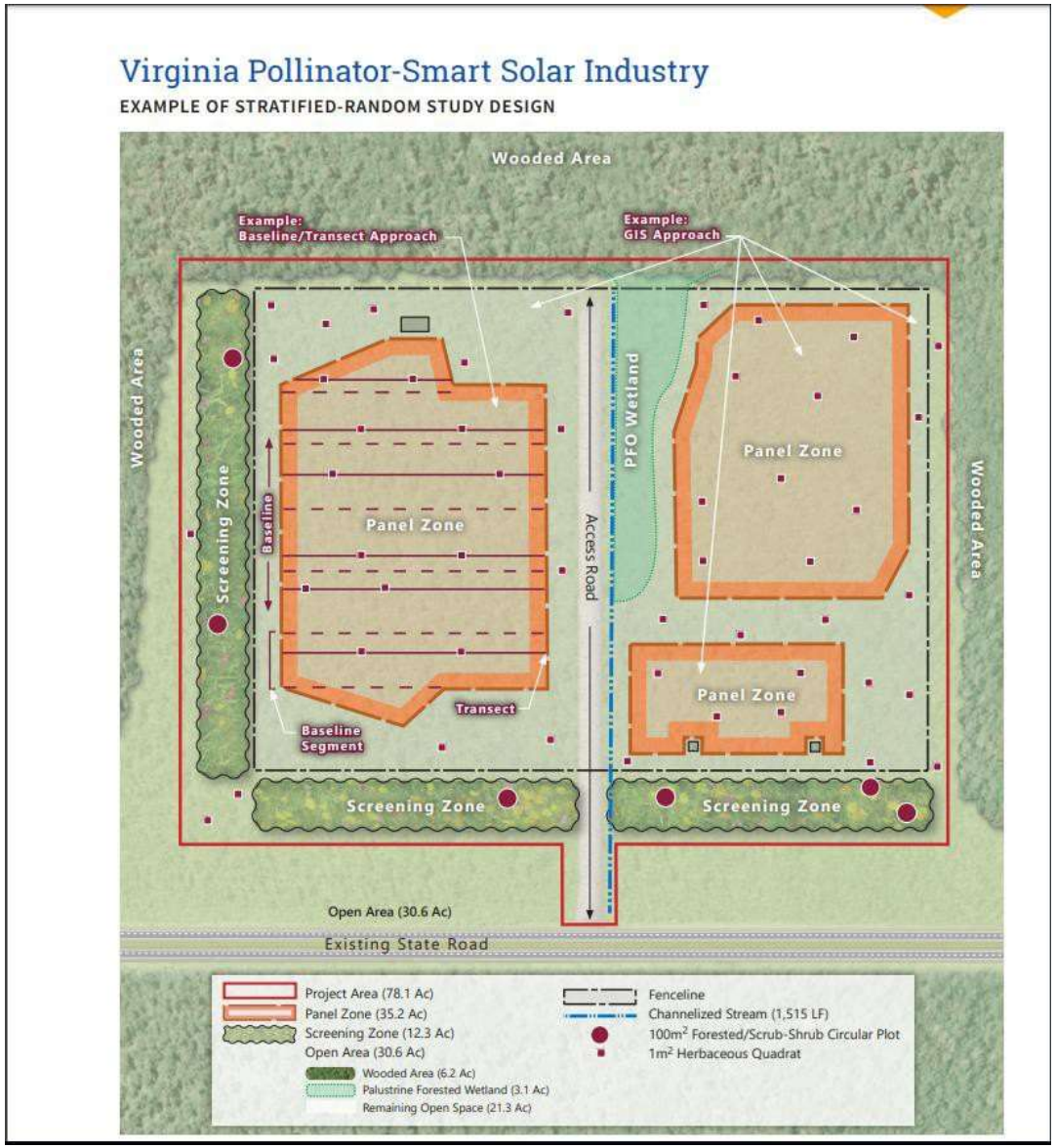
[3] *Up to a maximum of 10 points (50 features)*

Virginia Pollinator-Smart Comprehensive Manual





Virginia Pollinator-Smart Montoring Plan



Current Supply

- Virginia Solar Site Native Plant Finder
- https://www.dcr.virginia.gov/natural-heritage/solar-site-native-plants-finder

Scientific Name	Common Name	Light Regime	Moisture Regime	Plant_Type	Maximum expected height (in feet)	Pollinator?	Flowering Seasons	Grassland Species	Riparian Buffer	Riparian Zone
Achillea millefolium	Common Yarrow	Sun, Part	Moist, Dry	Herb	4	Yes	Spring, Early Summer, Late Summer, Fall	No	No	

Less Detail

Digital Atlas of the Virginia Flora: http://vaplantatlas.org/index.php?do=plant&plant=510

Commercially Available: Agrecol Native Seed and Plant Nursery, Applewood Seed Co., Buffalo Brand Sharps Bros Seed Co., Ernst Conservation Seed Co., Ohio Prairie Nursery, Prairie Restorations Inc., Roundstone Native Seed, Toadshade Wildflower Farm

Habitat from Flora: Ubiquitous in fields, meadows, roadsides, clearings, mesic to dry upland forests, and other habitats.

Synonyms: [= A. millefolium – FNA, Pa., R, SE, W.Va.; = A. millefolium ssp. millefolium – C, G; = A. millefolium – F, Y, Z; = A. millefolium var. millefolium – K]

Locality: Accomack, Albemarle, Alexandria, Alleghany, Amelia, Amherst, Appomattox, Arlington, Augusta, Bath, Bedford, Bland,

Arkansas Native Seed Program

Full-time seed coordinator hired

Building on a six-year old Audubon program

Small farmers growing 2 or 3 species each on 2 to 9 acres

Roundstone Native Seed LLC conducts cleaning and distribution

ARKANSAS NATURAL HERITAGE COMMISSION